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PUBLIC HEALTH AUTHORITIES AND THE CAMPAIGN AGAINST CANCER

CURTIS E. LAKEMAN,
Executive Secretary, American Society for the Control of Cancer.

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THE American Society for the Control of Cancer is honored by the invitation to be represented on this program, and welcomes the opportunity to ask the coöperation of American public health officials in special statistical inquiries and in educational propaganda in regard to this disease.

But as this is our first appearance in your councils, you will rightly ask for our credentials. It is reasonable that propaganda to combat particular diseases should justify themselves at the bar of the American Public Health Association, as there is naturally a limit to the number of special agencies that can or should be supported by the public and encouraged by the organized body of professional workers in this field. Your Association has a high duty to perform in applying its moral influence to prevent duplication of work and loss of motion in the public health activities of this continent. With any efforts to this end our Society is in full sympathy; as far as we are concerned we desire to subscribe to the principles and submit to the tests of efficiency and real service in either independent or coördinated endeavor.

What, then, is the plan and purpose of our organization?

A few years ago the American Association for Cancer Research, an organization of leading pathologists and laboratory students of this problem, recorded its conviction that although the ultimate cause of cancer still baffles human scrutiny, far too little use is made of the really vast amount of new and old knowledge of malignant disease that we already possess. Urging that it is not necessary, at least in this case, to know all there is to know about the nature and cause of the disease in order to limit its mortality, these men called for a country-wide effort to disseminate the present knowledge of cancer as the first step toward prevention and control. But this was only one of several converging impulses toward an organized campaign against the disease. For years the state of prevailing ignorance and

neglect of cancer in its early stages has been an old story to surgeons. By reason of that neglect an entirely unfair burden has been placed upon the profession. They have been called upon to operate as a last resort. They have been asked to work miracles, and in many cases they have met even that test. Their technique, advancing with the pathology and histology of cancer, has steadily won new triumphs. But the patients and the public have asked too much, and it is no wonder that surgery in cancer has not always been able to show a high average of success. Nevertheless, surgery in cancer is approaching the limit of efficiency, and if the operative method, as yet the first and almost the only recourse, is to save still more lives, aid must come from the patients themselves. Nor is this any the less true with other possible methods of treatment. In any case, the patients must come to treatment sooner, before the disease gets a foothold from which it cannot be dislodged. Realization of these facts has come to surgeons and physicians not as a scientific abstraction but as the result of steadily accumulating individual experiences with all their connotations of human suffering and grief. Every surgeon has records of patients that came months, even years, after the discovery of the first symptoms of cancer, nearly always too late to be saved. It is no wonder that the leading surgeons and gynecologists, here and in other countries, with a deep sense of obligation to stop this unnecessary waste of life, have attempted, individually and collectively, to teach the public that the hope of curing cancer lies in its early recognition and treatment.

Thus the American Gynecological Society, the Clinical Congress of Surgeons and other bodies appointed special committees to consider the subject of cancer education. Eventually the participation of nearly all the special medical societies of national scope resulted, and the American Society for the Control of Cancer was organized in May, 1913, on a broadly representative basis and with the interest and support of influential lay men and women. Almost at once the new organization was officially endorsed by the American Medical Association, the American Surgical Association, the Western and Southern Surgical and Gynecological Societies and by many local medical societies. The Society is supported entirely by voluntary contributions and by the dues of its members, which include both physicians and laymen, on the plan of the National Association for the Study and Prevention of Tuberculosis.

The purpose of our Society is succinctly stated in its constitution: "To disseminate knowledge concerning the symptoms, diagnosis, treatment and prevention of cancer, to investigate the conditions under which cancer is found and to compile statistics in regard thereto."

In working toward these ends we endeavor to act as a special collecting agency and clearing house of information in the field of cancer research, statistics and education. In this respect we stand midway between investigators, research workers, statis-

ticians and all other sources of information on one side, and editors, writers, lecturers, teachers and all the channels of disseminating information on the other hand. In both these fields, in gathering facts as well as in spreading information, we earnestly ask the coöperation of the public health authorities, and to explain our request in detail, is the object of the present paper.

At this point, however, we may be met with the objection that cancer is outside the scope of public hygiene. It will be truly said that cancer is not an infectious disease—at least in any ordinary practical sense. It is not subject to quarantine and disinfection. It has not usually been considered in the class of diseases amenable to public sanitary control. Why, then, should health officials add the cancer problem to their burdens?

We would answer without hesitation that the time is coming, if it is not already here, when public health administration must take fuller account of chronic diseases. The constantly broadening conception of the function of health authorities has already brought the leading departments into this field. I am proud to have been connected, even temporarily, with the New York City Department of Health, a sanitary organization, whose pioneer achievements have given it an historic leadership in municipal health administration. Among its glorious traditions the New York Board counts the early adoption of an extraordinarily broad view of public health functions. More than twenty years ago, by establishing the first public diagnosis laboratory in the world, by initiating the public manufacture and distribution of diphtheria antitoxin, and by creating the scientific service which has since made such distinguished contributions to bacteriological research, the New York Board carried into practice its belief that it is among the proper functions of the public health authorities to furnish any or all facilities and procedures connected with the prevention and cure of infectious diseases. What were then revolutionary extensions of the scope of the public health department are now among its commonest duties everywhere. A similar attitude has characterized the subsequent development of public hygiene in New York, and as in many other progressive states and cities, the activities of the Department are no longer limited to the control of contagious diseases. Any governmental authority that takes a similarly broad view acts in the spirit of that early Christian philosopher, whose light still shines in the phrase: "Nihil humanum a me alienum puto." With like scope of vision let every modern health department declare that nothing in the realm of preventable disease is foreign to its watchful care and interest.

A more definite and practical argument for community action against cancer and chronic diseases is found by analyzing the reduction of the death-rate. It is hardly necessary to remind you that the control of acute infectious diseases in infancy and early life has been the most important factor in the reduction of the death-rate in modern times. But along with this decrease in acute maladies, there has apparently

been, if not an increase, at least no perceptible decline in the prevalence of most chronic diseases. Studies of the evidence to this effect are numerous. One of the most recent is a life table prepared by Doctor Guilfoy, the registrar of New York City. This is based on the years 1909, 1910 and 1911, and the results are compared with a similar table for the years 1879, 1880 and 1881, prepared for the Federal Census Bureau by the late Doctor Billings. Broadly speaking, comparison shows that the expectation of life has increased for all ages below 35 and decreased at all periods above that age. In fact, all the evidence shows that the chronic degenerative diseases of middle and later life demand increasing attention from the forces which are attacking human ills on behalf of society. In so far as any or all of these diseases can be controlled by organized community efforts or by disseminating information as to their nature, prevention and cure, this is a challenge which the public health administration of the future cannot ignore.

Among the diseases of this general group, none is more important than cancer. Of intense human and social interest, clearly the first problem of medical biology, outwardly formidable and discouraging to all efforts for its conquest, cancer may still give more opening than any disease in this group to the well directed attacks of organized intelligence. This is because it offers a concrete problem and a method of attack. While we are waiting for that triumph of research which may lead the way to complete control, we can without the slightest doubt check the cancer death-rate, if only we succeed in disseminating among the people the elementary knowledge which we already possess, and in thoroughly bringing home the lesson of early recognition and prompt surgical treatment.

In relation to the educational campaign, the classical controversy as to whether cancer is or is not increasing is of secondary and academic interest. Whether or not the recorded increase in the death-rate is real or apparent, there can be no doubt of the present importance of this disease as a cause of death in adult years, or of the fact that much of the mortality from cancer is unnecessary and preventable. From the practical point of view, this is the only aspect of the matter that interests us. In 1912 in the registration area, 46,531 deaths from cancer were recorded. It is not likely that many of these deaths were falsely attributed to cancer. The only question is whether better clinical diagnosis and certification improved by autopsy control would not have made the figure still larger. Now 46,531 deaths in the registration area means by competent estimate, 75,000 deaths in that year for the whole United States. This is the figure that gives us pause, and throws the discussion of increase or decrease into the realm of scholarly abstractions. Seventy-five thousand deaths in a single year, against perhaps 150,000 from tuberculosis and 15,000 from typhoid fever! As social workers and health officers charged with the power of government to promote social welfare, must we not ask what

shall be done to reduce that formidable total from 75,000 to 60,000, or 50,000 or whatever may be possible? If it cannot be at once reduced, must we not do our best to hold it at 75,000, while the population increases?

The social importance of cancer is readily apparent when we consider the age distribution. The census report shows that the average age of death in cancer of all forms is 59 years as against 36 years in tuberculosis. Malignant disease attacks men and women in the prime of life when family and business responsibilities render them of greatest use to society. There are comparatively few deaths from cancer at ages under 35, but after that time of life the rate increases by leaps and bounds with advancing years. The importance of cancer as a disease of later adult life is concretely stated in the calculation that 83 per cent. of all mortality from cancer in the registration area between 1906 and 1910 was at the age of 45 and over. In 1911 the specific cancer death-rate in the registration states of 1909 stood at 61 for the age-group 35 to 44, 567 for the age-group 65 to 74, and 795 for ages 75 and over. As is well known the disease is more prevalent among women. Roughly speaking, the mortality at all ages is nearly twice as great among women as among men. At ages 35 to 44 about three times as many women as men die of cancer. At ages over 40 there are more deaths from cancer than from tuberculosis or pneumonia and in this period of life one woman in eight and one man in fourteen succumbs to malignant disease.

These facts are all familiar. We bring you no new knowledge on this occasion, but desire merely to emphasize present knowledge to buttress our appeal to you as health officers to join in the efforts to check this scourge. Surely a disease which causes the death of one person in eleven over forty years of age should claim a share of your attention. From any point of view the cancer problem deserves serious consideration, but it should not be made the occasion of alarming statements, exaggerated fears, or any other manifestation of loose emotion. Rather it calls for a persistent campaign of enlightenment based on nothing but the truth. In this work we believe that state and local boards of health should take the leading part in their communities, and should disseminate among the people the accepted elementary facts about the disease. This instruction should include the following essential points:

(1) Cancer is at first a local and not a constitutional or blood disease.

(2) In the early stages it is curable if promptly recognized and properly treated.

(3) The only reliable treatment yet known is prompt and thorough surgical removal. Medicine is useless. Radium, X-rays, and other methods may have their place in expert hands and special cases, but none of them constitutes the sovereign cure for cancer or supersedes the operative method.

(4) Cancer has not been proven to be hereditary or infectious, and fear because of other cases in the family is groundless.

(5) In the early stages cancer is usually painless and it is often difficult for the patient to realize that the seemingly innocent lump or sore is in reality the same disease that is only too well known in its later and more terrible stages. Yet the disease must be recognized and treated in the early stages to insure a fair chance of cure.

These and similar facts must be repeated through the length and breadth of the land until enlightened self-interest and informed intelligence bring the majority of cancer patients to their physicians or surgeons immediately on the discovery of early symptoms. But this campaign of education must be carried on without arousing needless alarm and without creating a state of panic and carcinophobia. Local agencies can best instruct the people and first among such agencies are the state and municipal boards of health.

In conclusion, then, let me summarize what we would like to have you, as health officers, do:

First, we ask you to take an active and continuous share in the work of careful, rational, public instruction. We hope that you will publish occasional articles in your monthly and weekly bulletins, prepare and distribute well-considered special circulars and leaflets, issue press notices, add this subject to the curriculum of your lecturers, and perhaps make use of certain charts and exhibits. Especially valuable, moreover, is the systematic instruction of nurses and midwives, particularly public health nurses, who come in contact with many people in their homes and are called upon constantly for advice on health questions. Let your nursing staff be fully instructed in the early symptoms of cancer. Remember that in the ordinary hospital training course a nurse is likely to see the disease entirely in the late and hopeless stages.

Already the state boards of Kentucky, Virginia, Louisiana, West Virginia, Michigan, Nebraska, New York, North Carolina, Kansas, and the city boards of New York, Toronto, Rochester and doubtless numerous other states and cities have undertaken some form of educational work in this field. In England, the cancer campaign is entirely in the hands of the public authorities. At the instigation of Mr. Charles P. Childe, a prominent surgeon of the south of England, the city of Portsmouth has commenced an active campaign which has recently been described by the Medical Officer of Health, Dr. A. Mearns Fraser, in a paper before the Royal Institute of Public Health, the British organization which corresponds to the American Public Health Association. Already other English health officers are taking up the work of instructing the people within their spheres of influence. The Central Midwives Board sends a circular of instructions on cancer of the uterus to every registered midwife in England and Wales.

In the second place we seek your assistance on the side of gathering information. We would consider this to be our chief function if we might be assured that the educational campaign would be taken care of by local agencies. There is and will be a continuing need of a central clearing house of information and statistics in regard

to cancer. We are interested not only in the improvement of cancer statistics generally but in the uniform recording of hospital and clinical experience with the disease and in the careful following up of operative results. We are interested, moreover, in special statistical investigations of the distribution of the disease and its greater or less prevalence in given localities. For the study of hospital records we have prepared a series of blank forms on which we are asking the leading cancer and general hospitals to furnish us with transcripts of case histories. As the tabulation and study of this material brings to light new and certain knowledge, we shall transmit it to you as the active centers for its further dissemination among the people.

In general, what is first needed is such an improvement in cancer statistics as will give information in detail regarding the specific organs or parts of the body affected, always of course, with relation to age and sex, and in the southern states to race. In this connection a notable advance has already been made by the Director of the Census in ordering, at our suggestion, the publication of cancer mortality statistics in much fuller detail than hitherto under some thirty titles of organs and parts on a plan similar to that used by the English registration office.

The coöperation of all statistical offices in the several states and cities is particularly requested to insure success of these plans for a more thorough and detailed study and recording of the incidence, treatment and mortality of cancer.

Discussion.

Dr. Charles J. Hastings, *Toronto:* In the establishment of the American Society for the Control of Cancer, there was established probably one of the most important and most valuable life-saving organizations on the continent. It is difficult to understand why those of us who have been entrusted with responsibility of not only preventing diseases but of prolonging and safeguarding human life should have overlooked our duties in regard to the educative phase of this problem.

Dr. C. F. Bolduan, *New York City:* In speaking of the way in which health authorities can aid, I thought the previous speaker overlooked one point, a point in which he has done quite a little, and that is in securing diagnostic facilities for examination of specimens. Some time ago in speaking to Mr. Lakeman about just this phase of the matter, he suggested that the New York City Health Department should, in connection with its diagnostic laboratory, also offer to physicians to diagnose specimens removed at operations. The suggestion was made in a formal letter to the Department of Health and was received very favorably. The Department was about to go ahead on that proposition, realizing the very great value of the suggestion that had been made, and then learned that the New York State Institute for the Study of Malignant Diseases in Buffalo, was prepared to do just that thing, and arrangements have been made now whereby physicians in New York State can send their material for microscopic examination to the New York State Laboratory. It seems to me that this is an example which health authorities generally might copy, because, as you all know, in a great many hospitals, small tumors and other things are removed at operations and unless there is a competent and interested pathologist connected with that hospital,

nothing further is done with that specimen and the physician frequently remains ignorant of what he has actually removed. It seems to me that health authorities might very well add to the diagnostic laboratory work they now do, a division of microscopical cancer diagnosis.

Dr. W. F. Snow, *New York City:* I should like to ask Mr. Lakeman a question. I was very much impressed with the clear-cut things he had in mind that health officers should do to help this new movement. Among those he stated that he desired to have us in the health department from time to time publish articles in our monthly bulletins—publish or distribute special pamphlets. Is Mr. Lakeman prepared to furnish the material or substance of such short articles and such a special pamphlet? It seems to me that one of the very excellent things Mr. Lakeman has in mind is reaching the public through local and state health departments, in other words serving as an agency, it seems to me, for furnishing the things that should be said, asking the health department to serve as the agency for giving prestige or backing to him, and I believe that is one of the important things that is coming about in the relation of public agencies to private agencies where we are overburdened with the administrative detail now put on the health department. If these private agencies that have all this material and serve as a clearing house, can bring this coöperation about, it seems to me it is a very favorable thing, and my question is how much assistance he is prepared to give us if we undertake to do this publicity?

Mr. Curtis G. Lakeman, *New York City:* Doctor Snow has exactly diagnosed the purpose and intention of the American Society for Control of Cancer; that is exactly the service we would regard as our privilege to undertake. We particularly feel that it is our function to act as a clearing house for gathering the latest and best information and statistics in regard to cancer and turning that into the form of articles or bulletins or data that can be sent out and used by the local health officers and any other appropriate agencies for the instruction of the people and we are not only ready but extremely glad to respond to the request of any health officer who desires assistance in that respect. The offices of the American Society for the Control of Cancer are located at 105 East 22d Street, New York City.

MIDWIVES: THEIR INFLUENCE ON EARLY INFANT MORTALITY.

C. C. Terry,
Health Officer, Jacksonville, Fla.

Read before the Health Official Section of the American Public Health Association, Jacksonville, Fla., December, 1914.

IN THE following review of deaths under one month in Jacksonville, for the past six years, I have attempted to suggest a line for further investigation rather than to add definite information to the multitude of causes which unite to render so perilous the first four weeks of life. Our figures, while not conclusive, are at least suggestive of a factor in early infant mortality which, by very reason perhaps of a complete medical understanding, has, for a period, escaped our daily vigilance.

My attention was first directed to a certain age-period, as presenting a field worth careful study, about a year ago, while preparing my annual report. In following the outline suggested by the Committee on Uniform Health Reports of the Massachusetts Association of Boards of Health, we classified our deaths under one year according to a table sub-divided differently from any we had before employed. Thus classified, there was presented a period which furnished seemingly an undue proportion of deaths in the first month of life. This period is determined from about the fifth to the eighteenth day of life, though under certain conditions its margins may extend from the third or fourth day to as late as the twenty-fifth day, depending upon rather definite factors.

It was also observed that the great majority of these deaths were those of colored infants, which fact, by reason of our local customs, naturally suggested ignorant midwifery as having, possibly, an etiologic bearing. Corroborative evidence was found by a review of the causes of death operating at this age period: "lockjaw," "convulsions" and "spasms" occupied prominent places in the list, while "hives," "cold," "too weak to live," "thrush" and other equally absurd terms, though not so suggestive, occurred with disquieting frequency within the same age-period.

An investigation for opthalmia neonatorum conducted through a district nurse threw additional light on the subject when she discovered that the term "hives," as employed by the negro midwives, was a condition characterized by inability to nurse and terminating in convulsions, actually, she believed, tetanus neonatorum. We had noted for several years that this infection occurred with considerably greater frequency in the practice of midwives than in that of physicians. For the year in question, 1913, out of a total of 12 deaths attributed to lockjaw of the newborn, 10 occurred in the practice of these women. During the age-period of tetanus we find, under "convulsions of infants," 5 deaths of the total 7;

under "prematurity," 3 in a total of 4 and under "ill-defined," 17, all of which were attended at birth by midwives.

The classification of deaths, where the sole attendant was an ignorant negro midwife, is of course far from accurate. Where the cause is given as "lockjaw," however, owing to the characteristic symptoms of the disease, one is inclined to lend credence to the statement, even were not their methods of handling obstetrical cases such as to corroborate their diagnoses. A knowledge of these facts leads one to view with grave suspicions of tetanus other deaths attended by them when occurring in this age-period, even though, perforce, classified under other headings.

Convinced by these preliminary findings that some regulation of the operation of these women was highly desirable, an ordinance was presented to and finally passed by the City Council "to regulate and define the practice of midwifery." This ordinance defines midwifery as does the statute of New York State. It provides for the issuance, by the health department, of permits to those who shall pass a satisfactory examination in the elementary principles of midwifery and it requires that free instruction in these principles be furnished by the health department. The penalty clause provides for fine and revocation of license.

I realize the incompleteness of the system, but make no apology for it as it was felt that no plan was destined to even partial success that should not recognize the inborn customs of the classes affected, for a time at least, the bill being framed to preserve the integrity of the midwife, as a matter of present expediency, while minimizing as far as possible her dangers by training her in the most important duties of her calling. It must be understood, in this connection, that for the past five years, 51.6 per cent. of all births in this city have been attended by midwives. To have debarred them from practice would at once have deprived more than half of the child-bearing women in the city of their customary attendant; many could afford no better service nor could I suggest any practical plan for replacing them, on so large a scale, with more skilled attendants.

Of necessity the training given them has been of the simplest nature, confined for the most part to the principles of surgical cleanliness, the prevention of opthhalmia and tetanus and the recognition of conditions requiring skilled intervention. Ophthalmia outfits, similar to those devised by Dr. J. J. Kinyoun and used in the District of Columbia, as well as aseptic umbilical dressings for the prevention of tetanus, have been prepared by the department and furnished free to all midwives and their use enforced, while each one is required to attend cases under the supervision of the department nurses.

To return to a discussion of the tetanus period, I would call your attention to the table on page 699, on which are shown the deaths under one month occurring in Jacksonville during the past five years, classified according to the table referred to above. The first column shows those deaths where the

attendant at birth was a midwife and the second column those attended by physicians. It will be noted at a glance that a marked difference occurs during a certain age-period and during this particular period alone. The deaths occurring during the balance of the first month run a nearly parallel course regardless of birth attendant. This period commences at the fifth day of life, reaches its height at about the ninth day and practically ceases by the 17th or 18th day. No other single cause of death operates with particular frequency at this period. Congenital malformations of the heart and other serious deformities, injuries at birth, atelectasis and many of the premature births succumb, for the most part, prior to the 5th day, and other acute infections do not begin until after the termination of the tetanus period. Here we have a period of about 12 days that furnishes for the 5 years, 1909–1913, 63.63 per cent. of all the deaths occurring in the first month of life where the birth attendant was a midwife and 33.78 per cent. where physicians attended the birth. During the same period of five years, lockjaw is given as a cause of death 19 times by midwives and 5 times by physicians, but in the practice of these women 140 deaths occurred between the 5th and 20th days as against 50 in the practice of physicians.

I believe that but little attention should be paid to the stated cause of death at this time of life whether the attendant has been a physician or a midwife as in both instances the cause is apt to be indefinite if not ridiculous. That tetanus neonatorum is a far more common cause of early infant mortality than our death certificates would indicate, I am convinced, and that it occurs also in the practice of physicians with inexcusable frequency is indicated by our records. It is interesting to note, in this connection, that it is given as a cause of death most often by those members of the profession whose known methods are such as would lead one to expect its occurrence.

I doubt if Jacksonville is afflicted with a more ignorant class of midwives than many other southern cities, and even in other sections of the country it is not improbable that a different subdivision as to age-periods, of the deaths occurring during the first month of life, would indicate the existence of an amount of tetanus hitherto unsuspected. The general mortality table in the annual report of the health department of Boston for 1912 permits the outlining of the tetanus period. This table shows between the 3d and 7th days a sudden and very marked rise in the number of deaths recorded, though none are placed to the credit of "tetanus," nor may the birth attendant be determined. A sudden upward curve at this period, however, should call for close scrutiny. No other report available contains a mortality table so sub-divided as to show the tetanus period.

That dangerous infections of any nature might be expected in the practice of these women, no one, familiar with their type, may doubt. They belong, for the most part, to the most ignorant class of negroes, many of them infirm through age and all governed by folklore and superstitions

quite easily traceable to the East Coast of Africa. A favorite umbilical dressing consists of grated nutmeg and raisins while lard or fat bacon is preferred by others; an approved prophylactic for stomatitis is the wiping out of the infant's mouth with one of its own soiled napkins and the occurrence of tetanus is attributed to the fact that the mother cried out with her labor pains.

Of almost general belief is the danger attendant upon bathing the baby or mother, changing the bedding or even sweeping the room within nine days after birth and, if to such imprudences were added the removal of ashes from the stove or fireplace, it is doubtful if even the most gifted among them could avert the dire consequences that would assuredly ensue. While ridiculous to relate, the tragic bearing of these beliefs and practices on early infant mortality must not be lost sight of. Not only should we take into account their active rôle as agents of death, through their filthy methods, but also their passive agency which operates through the custom, among our more ignorant and poorer classes, of supplanting skilled medical attention with the ministrations, however innocuous, of these women, during the early weeks of infancy.

I do not of course wish to imply that all of the deaths occurring during this "tetanus period" are caused by lockjaw. Other causes, peculiar to early infancy, probably operate to some extent throughout this period. That tetanus neonatorum, however, is a factor of importance would seem to be substantiated by the apparent results we have seen since the worst of our midwives have been removed from practice and sterile umbilical dressings have been used by the remainder. The average number of deaths occurring in this period yearly from 1909 to 1913, in the practice of these women, has been 28 and in the practice of physicians, 10. For the 11 months elapsed during the present year the midwives' cases show only 14 deaths and 7 of these occurred in the first three months of the year, prior to the distribution of our sterile umbilical dressings.

It is of course too early to draw conclusions, but the chain of evidence is so nearly complete that I feel warranted in continuing the system instituted and perfecting its operation as experience may show us new ways. Dr. Juan Guiteras has kindly furnished me with some figures from Havana where, since 1906, sterile dressings have been furnished to midwives. This has resulted in reducing the death-rate from tetanus from 7.11 in 1905 to 2.83 in 1912, per 1,000. Traumatic tetanus is included in these figures but, Doctor Guiteras says, the cases were nearly entirely those of the newborn. He does not state whether deaths between the 5th and 15th day, from causes other than tetanus, have been reduced since the institution of this procedure.

The following table shows the deaths occurring in Jacksonville in the tetanus period by months and birth attendant from 1909 to 1913:

DEATHS IN "TETANUS PERIOD" AND BIRTH ATTENDANTS 1909–1914.

	1909.		1910.		1911.		1912.		1913.		1914.		Totals 1909 to 1913.	
	M.W.	M.D.	M.W.	M.D.	M.W.	M.D.	M.W.	M.D.	M.W.	M.D.	M.W.	M.D.	M.W.	M.D.
Jan.	1	1	4	0	3	0	4	0	6	1	2	0	18	2
Feb.	2	2	2	1	6	0	3	1	3	0	3	0	16	4
Mar.	2	1	2	0	0	1	0	3	2	0	2	2	6	5
Apr.	1	0	1	0	3	0	5	2	3	1	0	0	13	3
May	0	0	0	0	4	1	1	1	2	1	1	1	7	3
June	1	1	2	0	5	0	4	2	0	2	3	0	12	5
July	0	0	2	0	0	0	3	0	5	0	0	0	10	0
Aug.	0	3	0	1	0	0	2	0	1	2	1	5	3	6
Sept.	3	2	0	0	3	3	2	0	5	0	2	1	13	5
Oct.	7	1	2	1	2	0	3	0	1	0			15	2
Nov.	4	3	1	1	6	1	2	0	2	0			15	5
Dec.	1	2	1	4	0	3	4	1	6	0			12	10
Total	22	16	17	8	32	9	33	10	36	7	14	9	140	50
Total all causes	32	28	35	25	43	35	59	31	51	29				

There is seen to be no marked seasonal occurrence, though the cooler months furnish a somewhat greater number of cases, the six month September to February, showing 61.5 per cent. of these deaths.

Greater uniformity in health reports and a more detailed sub-division of the deaths occurring in the first month of life would doubtless point to the not uncommon occurrence of lockjaw of the newborn, wherever ignorant or careless midwifery exists, whether practised by the "grannies" of the far South or by the less well equipped members of the medical profession.

Discussion.

MR. C. H. WELLS, *Montclair, N. J.:* I would like to outline briefly an ordinance that our Board of Health has adopted to control the practice of midwifery, simply to enable us to have a nurse at the house at the time of the delivery.

"Every person acting as a midwife in the town of Montclair shall notify the Board of Health by telephone or telegram, at the expense of the Board, immediately after such person is called to attend the confinement or as soon thereafter as the office of the Board is open, and

such notice shall give the name and exact address and name of the person to be attended by said midwife."

That enables the Board of Health in any case it sees fit to have a nurse there at the house. We know the conditions, we know all the practices of the midwife and are able to secure any medical attendance that is needed and the working out of that ordinance should result in a very material decrease in deaths among children whose mothers are attended by midwives.

DR. G. W. GOLER, *Rochester, N. Y.*: How many births do midwives attend?

MR. C. H. WELLS: Doctor Goler has a large city and we have a small city. We have about 500 or 600 births and possibly 200 midwife births. The importance of the matter may be sufficient, the result obtained may warrant us in hiring sufficient nurses to visit all the cases. I don't know that that will be done; it depends on how we find the conditions. It is a new ordinance and I cannot say how it will work out. It seems to me that in a large city there should be nurses enough to follow up all midwives who are not capable.

DOCTOR GOLER: I am only going to speak of what New York has done in order to foist the whole midwife question not only upon itself but upon the South. The midwife ought to be a disappearing institution. Instead of that we are doing something to keep the midwife alive. The midwife ought to be a dead one; we are trying to keep the midwife alive. When we began eighteen years ago under our present law, we had 35 midwives in a city of about 120,000 people, attending 40 per cent. of the births. We now have 8 midwives that attend a little more than 14 per cent., and every one of our midwives that comes before our Board for examination has to pass an examination just as strict as is passed by a third year medical student. We ought not to keep the midwife alive, we ought to pass her on. She does not belong in this art or in this country. That is all I have to say.

DR. WM. C. WOODWARD, *Washington, D. C.*: I am a little surprised to learn of any place where midwives are allowed to certify to deaths. There may be places other than Florida, but ever since I have had anything to do with the public health work, the death has always been certified to by our coroner in every case—the midwife, is, to a certain degree, a disappearing institution in the District of Columbia. At the present time only about 12 per cent. of the entire number of births are returned by midwives. That has been accomplished, however, by a system of examination begun in 1896. No midwife has been licensed in the District of Columbia to practice without examination, and during that time the number of births reported by midwives has fallen from about 42 per cent. to about 12 per cent. and the number of births occurring in hospitals has increased, the proportionate number indicating that there has been a transference. In order, however, to entirely eliminate the midwife, it will be necessary for the government to substitute some cheap service at the time of birth. A woman will employ a midwife who will render such services as she can at the time of birth and attend to the woman for a certain period after birth, giving many ministrations to the mother and child that no doctor will undertake to furnish. The only way to eliminate the midwife is to furnish some proficient and at least equally cheap service.

A MEMBER: I would merely like to state the way we feel about the midwife situation in New York City. The midwife at present delivers about 40 per cent. of all the births and they are doing really excellent work. We have them under pretty good control. All work under a permit of the Health Department. Their work is checked up constantly. We find that they obey many of the rules perhaps better even than the physicians; for instance, the rule in regard to treating the eyes and matters of that sort. The tendency in New York does not seem to be, I think, toward the abolishment of the midwife. I doubt whether we want to work to that end. What we do want to achieve, though, is the education of the midwife, and perhaps some of you know there has been established in connection with Bellevue Hospital, a training school, and the Department of Health now has established minimum standards of education, which standards are those given by the Bellevue Training School. Inasmuch as physicians, I think, do not like the work and usually, as they progress with their practice, give it up as rapidly as they can, it seems to me that we ought to recognize the fact that the midwife is a very useful institution.

THE RELIABILITY OF CERTAIN CLASSES OF DEATH CERTIFICATES.

DR. HAVEN EMERSON,
Deputy Commissioner, New York City Health Department.

Read before the Vital Statistics Section of the American Public Health Association, Jacksonville, Fla., December 2, 1914.

IN STUDYING the relation between the clinical diagnosis and the autopsy findings in three thousand consecutive cases at Bellevue Hospital up to 1913, and after comparing the inquest papers with the death certificates presented in 800 consecutive cases in 1914 by the coroner's physicians in New York City, I find such persistent and important discrepancies as to make me doubt the value of some of the mortality statistics of the city. I have no interest nor intent in suggesting that the grade of clinical diagnosis is any less high at Bellevue Hospital than it is at other well organized hospital in this country, but I think it suitable to admit the limitations of diagnostic skill when we are estimating the reliability of statistics of deaths. The best training school for the practising physician is at the morgue, particularly if he has had the opportunity to follow the clinical course of the cases which come to autopsy. I am inclined to believe that the statisticians and registrars of records would get almost as much benefit as the physicians from attending autopsies so that they may be familiar with the errors that inevitably occur in spite of the best intentions of the clinician, and be on their guard against accepting improbable or unsupported records of death. Without further discussing the defects of the present coroner system, neither the method of selecting of the officers nor the manner of fulfillment of official duties is such as to give confidence in the accuracy of their results.

On the basis of this study I would urge that measures be taken by registrars of vital statistics to provide a blank space on the death certificates for the statement of the pathologist's conclusion as to the cause of death based on autopsy or other similar pathological information. Further, I think it is time to admit that unsupported clinical diagnosis of cause of death is not sufficiently reliable information in all cases to justify such far-reaching conclusions as are at present drawn from the resulting figures by health administrators, which conclusions would be fully justified if they were drawn from death-rates which could be claimed as correct.

The coroner's office in New York City presents for record 13 per cent. of all the deaths in the city, and of these records, which it may be properly claimed present the maximum difficulty in reaching a complete and accurate opinion, an average of 12 per cent. only are based upon autopsies, of which a record written at the time of the autopsy is kept only in rare instances. Of the cases not autopsied, the certificate of death is presented on

information and belief based upon viewing the body and examination of witnesses. In the great majority of cases there is no information as to the previous history of the deceased, and there has been no physician in attendance. In spite of this almost total lack of necessary clinical information, diagnoses of chronic valvular disease of the heart, even specifiying the mitral valve as the seat of the lesion, or chronic myocarditis, chronic nephritis, congenital heart disease, arteriosclerosis, and broncho-pneumonia, are commonly reported, obviously records which are valueless in the absence of supporting information, such as can only be supplied by autopsy, in such cases of sudden death.

Of the 800 coroners' cases studied, 40 per cent. show altogether insufficient evidence to justify the cause of death as reported in the certificate. Twelve of the 800 cases are recorded as having died from convulsions, an obviously insufficient and unacceptable cause of death.

Over a period of nine months in 1914 we find 21 deaths attributed by the coroner's office to gas poisoning although ocular or spectroscopic proof of the presence of characteristic hemoglobin changes was not obtained to determine whether the exposure to gas in the room where the body was found preceded or followed death. Similarly there were in the same nine months, 371 deaths attributed to submersion, and yet without autopsy proof that the submersion preceded rather than followed the death of the individual.

Owing apparently to indifference or inadvertence there were found 72 cases among the 800 cases studied where there was essential disagreement between the inquest paper and the death certificate as regard the cause of death.

The simpler disagreements are such as these: Chronic myocarditis appears as the conclusion of the coroner's physician after the inquest, *i. e.*, viewing the body and hearing witnesses; endocarditis is the cause as entered in the death certificate; acute nephritis appears on the inquest paper, but chronic nephritis is the cause recorded on the death certificate. Clerical carelessness might account for these. Incomprehensible discrepancies are frequent, as where a hospital record is incorporated with the inquest paper showing that cancer of the bladder and retention of urine caused death; however, the corresponding certificate attributes death to chronic nephritis and acute uremia. Again, a young woman of twenty-two years is reported by witnesses to have been suffering from a severe headache for some time. Seeking relief she took an unknown amount of a "Bromo-Seltzer Headache Cure" and her death followed two hours later, but to the coroner's physician this appeared a plain case of chronic endocarditis and he so signed the death certificate without autopsy.

In seventeen cases there was a total disregard of the clinical record where the patient had died in a hospital and a sufficient clinical examination and record were available. Examples of this are abundant. Typical is the following: A man past middle life and far advanced in extensive pulmonary tuberculosis, took a dose of heroin and cut his wrists and throat with a razor

and was brought to a hospital and treated for traumatic hemorrhage. He admitted the act. The certificate declares the death to have been one of *homicide*, due to throat and wrists cut and no mention appears that pulmonary tuberculosis in any way complicated the case.

In another instance a man was admitted to a general hospital with a respiration of eight to the minute, pinpoint pupils, unconscious and cyanotic, a well-marked picture of morphine poisoning. He lived but a few hours and an autopsy was performed and a purulent bronchitis and chronic myocarditis appear to have been found and these two causes of death alone appear upon the death certificate, no mention being made of the clinical findings, quite incompatible with the morphological findings and no record appearing to indicate that any consideration was given to the clinical record.

In numerous cases suspicious events noted by the police or other observers were disregarded in filling out the death certificate. A man was found dead in a lodging house with a revolver in his hand, one chamber empty, and a hole through the roof of his mouth, and a profuse hemorrhage resulting from this. The police notes in the report are complete and detailed. The certificate states that death resulted from a rupture of a thoracic aneurism. Needless to say no autopsy was performed, the body was not carefully viewed, the witnesses were not examined and the cause of death as stated by the coroner's physician is based on a guess as to the origin of the profuse hemorrhage. Instead of death from violence self-inflicted, we have a record indicating that one of the common tertiary lesions of syphilis caused the death.

The futility of basing any conclusions or determining action in public health work upon such reports of death is evident. I think it is fair to say that with the possible exception of the autopsied cases coming under the coroner's notice, the 13 per cent of deaths reported through the coroner's office represent no reliable information.

Of the death certificates presented from all other sources in the city than the coroner's office, autopsies were performed and reported in the certificate in 1.4 per cent. of deaths.

In Manhattan,	2.6	per cent.
" The Bronx,	.2	" "
" Brooklyn,	.2	" "
" Queens,	.2	" "
" Richmond,	1.6	" "

The study of autopsy records at Bellevue Hospital shows that even where attentive and conscientious clinical observation is supplemented by coördinated and efficient laboratory and diagnostic aids, the complete and correct diagnosis of cause of death is not presented by the physician in as many as 50 per cent. of the cases. It will be recognized that there are certain medical and surgical conditions which in the course of their treatment or observation offer almost as reliable information as to the cause of death as can be presented by the pathologist's autopsy. In many instances, as fractured skull, the X-ray gives physical proof to justify and support a clinical diagnosis. Operations which offer

opportunity of direct inspection of internal lesions, as of brain abscess, kidney tumor, or malignant neoplasms of various parts, give as nearly as possible the same information as is obtained at autopsy, even when the latter is supported with microscopic tissue sections and bacteriological culture of pus to substantiate the macroscopic evidence.

Meningeal inflammation with the etiological factor obtained from the spinal fluid, bacteriemic diseases with culture of infective organisms obtained from the blood, specific serological reactions in some diseases, direct or indirect ocular examination of deeply situated structures, accessible through body openings, all present means permitting of accurate and satisfactory records of the cause of death.

One may add that deaths from most of the infectious diseases are correctly reported. In the infectious diseases as recorded in the Department of Health an error in diagnosis of only 1.6 per cent. occurs, as proved by the study of the result of the disease and the clinical course. These cases are carefully checked and kept under observation until recovery or death, and it may be accepted that the small margin of error does not cause any important falsification of our vital statistics.

The so called non-preventable diseases, the progressive organic diseases of the decades from forty upwards, show a proportionate increase as the infectious and preventable disorders of earlier life are decreasing. It is precisely in these diseases that the chance of inaccuracy is greatest, as their diagnosis is based on clinical data not capable in all instances of positive proof during life, although treatment based on the probable diagnosis may have resulted in noticeable improvement of symptoms.

The entire public health movement is based on the possibility of diminishing death and sickness. Our knowledge of the cause of death is based on reports of physicians and coroners. The expenses to the community are so heavy and the necessity of prevention of disease so obvious that the greatest obtainable accuracy ought to be available and only the results of verified diagnosis of cause of death used for the fundamental argument which supports and justifies the greater part of the functions of departments of health.

Universal autopsy practice is unlikely. Education as to the needs of autopsy for the sake of raising the standard of medical practice and diagnostic skill, and for the sake of the public welfare, will slowly prevail against religious objection and racial sentiment. In the meantime we have at hand a means of gathering reliable data by separating the records of death based upon autopsy or other equally valid verification of the cause of death, from deaths which were neither preceded nor followed by sufficient skilled medical or pathological observation. By such a method we should attain two important objects: We should gather facts concerning the cause of deaths against which little or no criticism could be brought, and we should have parallel records of causes of deaths based in many instances upon surmise or insufficient scientific observations.

THE PUBLIC HEALTH AS AFFECTED BY CHRONIC DISEASES OF THE HEART, KIDNEY AND ARTERIES.

HORACE GREELEY, M. D.,
Brooklyn, N. Y.

ETIOLOGY.

LESIONS of heart, arteries and kidneys are found at all periods of life between extremest youth and oldest age. In infancy such cases of chronic heart disease as appear are often due to such developmental faults of the heart or large arteries as cause almost immediate manifestations. Owing to the mechanical factors involved, or to the fact that under such difficulties as are presented by a partially patent foramen ovale or defective valve, the extraordinary muscular strain required to maintain the circulation either directly injures or leads to a hypertrophy whose requirements soon surpass the nutritional possibilities, and consequent starvation and degeneration of the musculature ensue. Developmental imperfections of like character, though of less extent, are undoubtedly responsible for some of the tendency that is observed among families to suffer from chronic heart disease, most of which, however, is probably due to abnormal lack of resistance to those infections, especially rheumatism, which are so frequently directly responsible for its inception.

In youth, before twenty years of age, especially in females, the frequency of acute articular rheumatism, acting to produce an acute endocarditis frequently resulting in permanent injury to the valves, is a causative factor of great importance as regards subsequent chronic disease. Apart from cases associated with arterio-sclerosis or renal disease, such injury from an acute infectious process is probably responsible for nearly all cases of organic heart disease that develop in adult life. Both etiologically and pathologically, chronic heart disease has been divided into cases with primary valvular lesions, cases with cardiac lesions secondary to arterial disease and cases where the heart involvement has been secondary to, and determined by, renal degeneration, but since all attempts along these lines lead to much overlapping and repetition, strict classification of the etiological factors adduced has been avoided.

Agents which cause continuous overaction of the heart, either by causing muscular degeneration through exhaustion, or by direct toxic action upon the muscles or nerve cells, are causes of degenerative changes in the organ. So also is any obstructive influence to the onflow of blood such as lung tuberculosis or cirrhosis, emphysema, stenosis, etc. But especially important is systemic arterio-sclerosis or a constantly constricted arterial system, resulting from the prolonged irritant action of such substances as

alcohol, nicotine, lead, the results of the perverted metabolism of gout, and particularly from the retained waste of chronic nephritis and the overloading of the blood with the products of digestion, notably protein, and intestinal putrefaction.

Syphilis may affect the heart at all periods of life through the activities of the infection in the endo- and myocardium, coincidently of course, with the pathological process which extend throughout the arterial tree in this disease.

Certain occupations that entail prolonged great muscular strain lead to great increase in the bulk of the heart, and, it is held, without commensurate increase in the mechanism by which its cells are fed. This leads to eventual degeneration and dilation. However, it is more than probable that the main cause of the degenerative phenomena is the extra strain to which all the elements of the then more powerfully acting organ are subjected—a strain which is correspondingly more apt to result in accidents to valves, corda tendinæ or nutrient vessels. A sudden severe strain acting on a poorly nourished anemic heart is credited with the ability to produce sudden dilations.

The heart musculature may degenerate in common with similar structure elsewhere when subjected to the long-continued action of vitiated plasma, though this be from diabetes, gout, anemia, primary or secondary, cancer, or infectious agent. This degeneration may be produced either directly through the poisonous action of substances peculiar to the condition or through defective nutrition.

However, apart from the valvular lesions (which, in keeping with their association with acute infectious processes, are more common in the young, between twenty and thirty years of age), the most important cause of chronic heart disease is arterio-sclerosis, and since the heart is but the most active part of the circulatory system, we would expect it to suffer in every instance of this disease, and such is the case. Not only are the endocardium, chorda tendinæ and valves involved in the degenerative processes of this malady, but the coronary arteries and their ramifications in the myocardium are frequently so sclerosed as to seriously compromise the nutrition of the organ. In some instances this circulation is so interfered with that sclerotic areas develop in the walls of the ventricle and acute dilation or even rupture may result.

The anatomical location of the mouths of the coronary arteries is regarded as exposing them peculiarly to the effects of increased blood pressure, since when a hypertrophied, powerfully acting heart throws the blood into the highly resistant arterial tree, the rebound against the closing aortic valve is directly felt in these arteries, arising as they do just beyond the valve.

In these days of wide exploitation and considerable use of coal tar drugs, we sometimes meet individuals who have so paralyzed their circulation and undermined their health through misuse of these agents, that the con-

clusion seems warranted that in at least a few instances degeneration of the cardia has directly resulted.

As statistical evidence of the relative importance of the various etiological factors of heart disease, I quote the figures given by Dunn* in a series of 304 cases. Rheumatic fever was operative in 87 per cent., other infections in 3 per cent., congenital lesions in 7 per cent. and unknown agents in 3 per cent.

Lambert† quotes cases as follows: "Church recorded 889 cases of rheumatism, with 497 cases of acute or chronic heart disease among them. Thompson reported 706 with endocarditis involvement in 329. Lambert, 500 cases of rheumatism admitted to Bellevue Hospital of which 253 showed endocarditis. Thus in a total of 2,095 cases of rheumatism, 1,076 or 51.3 per cent. showed cardiac involvement."

As to the effect of syphilis: The experience of the Gotha Insurance Company of Germany is valuable. This was presented at the Fourth International Congress of Examining Physicians and covered the cases of 1,778 men insured between 1852 and 1904 who had had previous antisyphilitic treatment. Deaths among these gave a ratio of 168 actual to 100 expected. Expected deaths from various causes as compared to actual were also given, and while it was shown that among these once syphilitics, ages 36–50, the principal cause of death was involvement of the nervous system, between 51 and 70 they were mostly from the disease of the heart, blood vessels and kidneys.

As to the effects of alcoholics: "Statistics show that both in Europe and America over 50 per cent. of deaths from cerebral hemorrhage, heart disease and nephritis, are consumers of alcohol."‡ Insurance company comparisons show that from 10 to 15 per cent. more deaths among non-abstainers than others occur. Further, that a moderate drinker of 40 should be charged at the rate of an abstainer of 50 or 55. The Medico-Actuarial Mortality Investigation (New York, 1914) results for alcohol (in Vol. IV), show that among those guilty of occasional alcoholic excess, the mortality is from $1\frac{1}{3}$ to $1\frac{3}{4}$ times the expected at all age groups. Among steady free users from $1\frac{1}{3}$ to 2 times the expected.

As to digestive influences: Doctor Hodges (at the fourth mid-year meeting of medical section of American Life Convention) reported a series of thirty cases, in many of which digestive disturbances, acting over long periods, preceded the cardiac and renal disease.

Cabot§ with the help of modern diagnostic methods, including the Wassermann reaction, classified 600 recent hospital cases, in which a failing heart was the most notable feature, with the following result—in which the marked preponderance of rheumatic cases is a main feature.

* *American Journal of Diseases of Children*, August, 1913.
† *Journal American Medical Association*, March 7, 1908.
‡ Doctor Crothers, Fourth International Congress of Examining Physicians.
§ *Journal of American Medical Association*, Oct. 24, 1914.

	Male.	Female.	Totals.	
Rheumatic	108	170	278	
Syphilitic	52	22	74	
Arterio-sclerotic	53	40	93	
Nephritic	59	58	117	
Total of principal causes	272	290	562	or 93% of all.
Goitre heart	3	5	8	
Doubtful	19	11	30	
Totals	294	306	600	

Irrespective of theories, we know that there are many conditions giving rise to a vitiated plasma, which are uniformly associated with arterial disease. Syphilis is such a prime factor and its damage is so insidious and extreme, that from the standpoint of some life insurance medical men, once a syphilitic is always a syphilitic. Since it is reported that fully 20 per cent. of the general patrons of hospitals during the past few years, and over 8 per cent. of the peddlers recently examined in New York City by the Department of Health, gave positive Wassermann tests, and for other reasons, fully 10 per cent. of the general population can be conservatively regarded as having at some time or another, suffered from the malady. Further, since few so infected are fortunate enough to experience Ehrlich's therapia sterilans magnat. the circulatory systems of the same percentage of the community can be regarded as having been damaged by syphilis. Alcohol and tobacco consumption in moderation can hardly be regarded as more causative of arterial degeneration than the digestive fermentation products to which fully twice the same number of the populace is subject, but when either of these two stimulants, or even coffee, is employed to drive a circulatory system already badly in need of rest, to more and still more work, the combination of stimulant-irritant with physiological store exhaustion cannot but fail to effect that oft-repeated cell damage which soon results in the fibroid changes of arterial disease.

The nervous tension of the hard-working business man in our cities effects somewhat similar results, since nervous driving force, probably acting through gland secretions, as that of the suprarenals is even more capable than either alcohol or tobacco of whipping a circulatory system to work beyond the physiological limit where entire recuperation is possible. Of course, it is just such a case as this that frequently feels the greatest need of a stimulant to moderate the discomfort and inconvenience of the period of exhaustion sure to follow the over-action considered, and if it be a rule to yield to such temptation and the ship, the circulatory system, be driven still

further at the expense of its timbers, the fate of the famous vessel of Jules Verne's *Phineas Fogg* can but be soon reached. At first thought it is difficult to understand how the activities of a business man at a desk, a brain-worker, can compare in wear-and-tear effect with that of a man at the plough or on the wood pile, but when (apart from questions involving the particular salubrity of outdoor air, and the stimulus to digestion of physical labor) we consider that either of the latter operations demand but simple movements of powerful sets of muscles acting almost as units, and with almost the monotony of pendulum action, we realize that comparatively little nervous stimulation is required. Such labor, when not carried to unusual extreme, is but little more destructive of tissue than the rhythmic pulsations of the heart; and, as the latter's rest between beats suffices to prevent damage from overwork, so the complete though momentary suspension of nervous stimulus to the muscles, arterioles and internal-secretion glands, in the alternating muscle-group work of manual labor, acts to spare the finer arterial structure, while the opposite conditions prevail when brain work is involved. Here, a constantly tense arterial tree is required to maintain the needed current and pressure in the central nervous system, and the vessels suffer accordingly. Furthermore, while muscular fatigue drives to early rest, nervous fatigue is easily lost in the overstimulus of anxious or exciting work which has little effect upon the muscles, or again is overcome by the whip of alcohol, tobacco, coffee or the like. Besides, there is no mechanism by which circulatory fatigue can directly manifest itself.

Exposed to the usual influences and hardships of life, the animal organism eats when it is hungry, rests when it is tired, but under the conditions of civilization, eating is primarily a pleasure and rest is often only taken when there is nothing else to do, or where the abnormal stimulants mentioned can no longer substitute or postpone it.

Overeating supplies the material, and nervous and general exhaustion so weaken the digestive activities, that intestinal bacterial agents are allowed full sway, and their activities produce phenol and skatol bodies which diffuse into the blood stream and contribute to the phenomenon familiarly known as autointoxication, which acting continuously is undoubtedly capable of seriously damaging the circulatory system.

Apart from the toxic products of excessive gastro-intestinal fermentation, the food intake is thought to effect the arterial system in another way, and that is through a flood of normal digestive products, especially of protein food, after a well digested heavy meal, so great that both the processes of assimilation and excretion are swamped, and which in their unusual concentration act as irritants to the arterial wall.

Long continued and severe muscular strain, as sustained by longshoremen, while evidently capable of producing arterio-sclerosis is so seldom the sole

contributing element that as a community factor it is indeed insignificant. *Chronic Renal Disease*, as apart from the arterio-sclerotic kidney frequently associated with disease of the blood vessel, and the amyloid condition consequent upon prolonged suppurative processes, occurs in the main varieties known as the parenchymatous and the interstitial, and while these two conditions frequently co-exist in the same organ, there is a distinct tendency of certain etiological factors to produce the one and of other influences the other.

Chronic disease of the parenchymatous form may follow an acute attack, as that induced by scarlet fever or pregnancy, but this is rare, and the disease is usually of insidious onset and somewhat obscure etiology. The most reasonable supposition in regard to the way in which the damage to the renal epithelium is brought about, seems to be that which ascribes these cases to the irritating effect of toxins of infectious or perverted metabolic activity, acting over long periods.

Of course, the very function of the organ suggests that the disease is probably usually due to irritation by abnormal substances passing through from the plasma in the process of excretion. Therefore, the toxins of infectious disease and the results of the ingestion of large amounts of alcoholics are prime factors, as also seems to be prolonged exposure to cold and damp. However, such agents as more commonly lead directly to the interstitial form of the disease may sometimes produce a primary parenchymatous degeneration, for instance, the abnormal products which circulate in the plasma in cases of diabetes, marked intestinal fermentation, or chronic metallic poisoning as with arsenic mercury or lead. Interstitial nephritis may be blended with manifestations, of arterio-sclerosis, which in greater or less degree usually accompanies all cases of chronic nephritis, and it may be a terminal condition of the chronic parenchymatous form, but frequently the connective tissue proliferation is so markedly primary and independent of either of these conditions that separate recognition must be accorded to this form of the malady. It seems to result mainly from vitiation of the plasma by the agents recounted above, but is very commonly directly produced by syphilis. In certain malarious districts this malady also acts to produce this form of kidney disease. Generally, chronic nephritis is more frequent in males than in females, evidently owing to different degrees of exposure to the exciting influences. Arterio-sclerosis and chronic cardiac and renal disease arising in so many instances contemporaneously, or one as a result of the other, and apparently under like or allied influences are thus bound together inseparately in the consideration of all the wear-and-tear effects of human adult life.

Prevalence.

There are available very few statistics bearing on the incidence in various

classes of the population of the three affections under consideration, and those that exist are fragmentary.

Among the thousands of dependent children passing through the Randall's Island institutions, the attending physician, Doctor Harris, tells me that in the neighborhood of 2 per cent. show cardiac lesions, but that in respect to kidney disease the rate is certainly considerably under 1 per cent.

The Bureau of Child Hygiene of the New York City Department of Health began making physical examinations of the children in the primary public schools in the fall of 1908, and from its records (which of the diseases in question only cover those of the heart) I obtained the following figures:

Year.	No. of children examined (usual ages 8–12).	Cardiac lesions.	
		Found in.	Per cent.
1909	231,081	1,503	0.65
1910	266,426	1,426	0.53
1911	230,243	1,661	0.72
1912	287,469	1,597	0.55
1913	330,179	1,912	0.57
Average	269,079	1,619	0.60

Dependent children in city institutions were examined in 1913 to the number of 19,445 and 392 cardiac lesions were found, giving a morbidity rate of 2 per cent. which is in accordance with the experience on Randall's Island mentioned above.

Beginning with the same year, 1909, children 14 to 16 years of age who wish to go to work in New York City, were compelled to submit to examination by a health department physician in order to determine their physical fitness.

Results as regards cardiac disease found, have been as follows:

Year.	No. of children examined, 14–16 yrs.	Cardiac lesions found in.	Per cent.
1909	4,125	21	0.5
1910	24,673	131	.5
1911	29,820	230	.8
1912	43,254	453	1.5
1913	20,335	310	1.5
Average	24,441	229	0.96

Most of these children are probably also included in the figures derived from the examinations made of those attending school.

Advancing to a consideration of the next period of life, the collegiate or undergraduate, I have obtained most interesting figures from the Department of Hygiene of the College of the City of New York. Here, since 1908, 8,817 youths of both the preparatory schools and collegiate departments have undergone careful, general, physical examination, as a matter of routine. Cardiac impairment was found in 162 instances, giving an incidence percentage of 1.83. Urinary examinations were not part of the routine, nor were any arterial lesions noticed.

The next age-period available for consideration comprises the workers of the community, and as the value of figures in this connection depends entirely upon the care and validity of the examining authorities, I have been particularly fortunate in securing the records of the Life Extension Institute of New York City, and those of the New York City Health Department, obtained from the examination of its employees. As pertaining to our subject they are presented in the following tables:

RESULTS OF THE EXAMINATION OF EMPLOYEES OF COMMERCIAL HOUSES, BANKS, ETC., IN NEW YORK CITY BY THE LIFE EXTENSION INSTITUTE.

(Figures based on the examination of over 2,000 individuals—average 30 years of age—made within the last few months.)

Lesions found.	*Percentage.*
Organic heart disease	5.38
Arterio-sclerosis	13.10
Urinary symptoms, albumin, sugar, casts	35.63
Cases showing combined disturbance of circulation and kidneys	12.77

RESULTS TO DATE OF ALL EXAMINATIONS OF EMPLOYEES OF THE NEW YORK CITY HEALTH DEPARTMENT, 696 INDIVIDUALS, AGES 15 TO 74, AVERAGE 32.75.

"Cardiac derangements of various degrees of severity and importance," found in	92 or 13.2 per cent.
Some albuminuria found in,	209 or 30 per cent.
Systolic pressure of 150, plus, and some albumin present in urine, found in	25 or 5.5 per cent.

Statistics presented to the Fifteenth International Congress on Hygiene and Demography by the Director of Investigation of the New York Factory Investigating Commission, show that among 2,486 workers, findings were as follows:

Trade.	No. examined.	Heart disease found, per cent.	Arterial disease found, per cent.	Bright's disease found, per cent.
Bakers	800	6.8	..	0.3
Tailors	800	4.5	4	0.4
Tobacco work	600	4.2	..	....
Furriers	83	6.0	..	....
Printers	203	2.9	..	....
Average all trades		4.88	4	0.35

In 1912, the Joint Board of Sanitary Control of the clothing industry undertook a physical examination of 800 workers employed in this line in New York City. Very few of these individuals were under twenty (104 actually, 12½ per cent.), while 598 were between 20 and 45 years of age, and 98 over 45. Pertinent findings were:

Persons examined	800
Cases organic heart disease found	36 or 4.5 per cent.
Cases arterial disease found	32 or 4.0 per cent.
Cases chronic nephritis found	3 or .4 per cent.

The Committee on Factories of the Chicago Tuberculosis Institute, recently engineered a campaign to further medical examination of employees, as a result of which statistics, presented by Doctor Sachs to the tenth annual meeting of the National Association for the Study and Prevention of Tuberculosis, show:

Among Applicants for Work.

No. examined	666
Chronic heart disease	7 or 1.05 per cent.
Bright's disease found	9 or 1.35 per cent.

Employees' Benefit Association.

No. examined	500
Chronic heart disease	9 or 1.8 per cent.
Bright's disease	6 or 1.2 per cent.

Regular line, life insurance examination experience, is well shown in a paper by Dwight (*Boston Medical Journal*, Oct. 26, 1911), covering the experience to date of paper, of the New England Casualty Company, and is conveniently exhibited in the following table:

Percentage of Risks Declined Which Were on Account of Circulatory Disease, 1844 to 1910.

Territory.	*Percentage.*
New York City and New Jersey	69
Boston and Massachusetts	68
Philadelphia and East Pennsylvania	52
Chicago and Illinois	47
Group of Western cities	45
Group of Southern cities	43

The total percentage of the number of applicants declined by insurance companies on account of various disabilities varies between 10 and 25 per cent., regular line policies; in the large cities of Boston and New York, the average rate is 20 per cent., so that in the neighborhood of one-fifth of the figure given by Doctor Dwight, represents the percentage of all applicants which were declined on account of the various diseases mentioned. A physician official of the Mutual, New York City, tells me that Doctor Dwight's figures were representative of the experience of his company.

While the statistics from these different sources are not altogether corroborative, one set of the other, their general trend is the same, and as a whole we may say that the prevalence of the diseases in question (to the clinical extent discoverable by such examinations) may be estimated about as shown in the following table:

Class.	Chronic cardiac disease.	Other circulatory.	Bright's.
Children under 15	0.6 to 2 per cent.	?	1 per cent.
Youths 15 to 25	1.83 per cent.	?	?
Workers 25 to 45	1.5 to 5.38 per cent.	4 to 13.1 per cent.	0.3–5.5 per cent.
Business men over 45	8.1	5.7 and over	?

From the above the rapid increase in prevalence of these wear-and-tear diseases, as the individual advances in life, is apparent, and since only their gross effects are apt to be discovered, we readily understand their importance and the need of effort to control them in a community.

Mortality.

Apart from defective registration, vital statistics are apt to be misleading for some very important reasons, which are that they are necessarily gathered over different periods and by different men under rules almost as varied and as changing as the styles of dress. If we look up old mortality statistics for organic heart disease, we, for instance, find it here lumped with all forms of endocarditis, or "dropsy," and most probably complicated by additions of many sudden deaths from miscellaneous causes, to an extent dependent upon the sagacity of the physicians of the time or place. Even circulatory disease, as a total, is of varying comprehensiveness, since even today the census authorities include diseases of the lymphatics and cast out cerebral hemorrhage, a condition most certainly dependent upon arterial degeneration. Chronic kidney affections have sometimes been grouped with acute inflammations of these organs. Apart from this we know the record (such as was reported by Cabot a year or so ago in the *Journal American Medical Association*) of divergence between even the best clinical diagnoses, upon which all public statistics depend, and autopsy findings. Therefore, we must not lean too confidently on such broken reeds as the figures which we may dig out, to bolster up a theory. We not infrequently hear "Heart disease has increased 57 per cent. in the United States Registration Area since 1880." "In Massachusetts the rate has risen 105 per cent. during the same period." "In Chicago the death-rate from diseases of the kidneys has increased 167 per cent. since 1880." "The apoplexy rate has increased in the United States Registration Area 84 per cent., and in Massachusetts 135 per cent. in the last 30 years." All of these statements, quoted from authorities, are based upon actual statistics of more or less reliability, but the truth of the deductions made therefrom can well be questioned for reasons such as I have mentioned. Even the comparatively very reliable mortality statistics of the city of New York, upon examination show the marked effects of changes in classification, and of rulings by the authorities as to acceptable causes of death. For instance, the total deaths

from cerebral hemorrhages, recorded yearly from 1900 to 1907, varied between 2,449, lowest, and 2,833, highest, number, while during the same period all classed as from diseases of the circulatory system, exclusive of those of the heart, varied in the same way, between 471 and 878. In 1908, however, either because of changes in routine or requirements on death certificates, or for some other reason, a marked shifting of the usual returns occurred. Cerebral hemorrhage dropped to 1,942 in 1908, then to 945 the next year, and up to and including 1912 had not exceeded 1,130, a figure more than 50 per cent. below that of the lowest yearly cerebral hemorrhage returns, 1900 to 1907, as quoted. It seems that what the cerebral hemorrhage classification lost, general circulatory (exclusive of heart as above) must have gained, since when the number of deaths in the former dropped in 1908, those in the latter almost doubled, being reported as amounting to 1,597, and amounting in 1909 to 2,431 (an increase within 2 years of over 250 per cent.), with 2,370 as the lowest since. However, when the figures are combined (other circulatory plus cerebral hemorrhage) as I have done in the tables included herewith, it seems that at least one possible cause of false deduction will be avoided.

Referring first to Table I, which covers the United States Registration Area, the most accurate, as yet, statistical period, 1900–1912, it will be seen by a glance at the chart and examination of the figures from which it is drawn that organic heart and other circulatory death-rates have climbed within 13 years 31.4 and 19.9 points respectively. Further, that a slight average increase (Bright's) has accompanied the other. To the consideration of Table I, join that of Table II, covering the same factors for the same years in the greater city of New York. Here, let me first mention, that for purposes of comparison I have recorded the rapidly declining high tuberculosis and the slowly falling low typhoid rates. According to the figures, the heart rate has increased crudely 62 points, nearly twice as fast as in the national area, but both Bright's and other circulatory have fallen, crudely, the first 31 and the second 17 points, why should the statistics of the two authorities as regards the last two classifications point in opposite directions? It is hard to say, unless we believe that measures to control the infectious diseases in the metropolitan district have been markedly more effective than those maintaining over the Registration Area and that as a consequence the incidence of these arterial and renal degenerative conditions, which so frequently follows such infections, has been correspondingly lessened. In Table III are combined the New York City organic heart and Bright's disease rates over a period of 44 years, and in the clipping taken from the last published yearly report of the Department of Health of the same city, the separate rates of the same diseases for the Boroughs of Manhattan and the Bronx are given—general circulatory disease figures for this period cannot be accurately obtained.

TABLE I.

DEATH-RATES PER 100,000 POPULATION FROM CHRONIC DISEASES OF HEART, ARTERIES, AND KIDNEYS, 1900–1912, U. S. REGISTRATION AREA.

(In this and the following Table II, cerebral hemorrhage—apoplexy—has been included in "Other Circulatory.")

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
Heart	111.2	113.4	117.3	124.5	133.4	131.3	127.6	137.5	128.3	129.7	141.5	140.9	142.6
Bright's	81.5	81.3	81.6	87.6	92.7	92.9	87.9	91.9	83.8	88.5	88.5	87.5	92.5
Other circulatory	103.5	102.2	104.7	103.6	109.7	112.1	110.8	117.9	113.4	119.8	118.1	119.1	123.4

TABLE II.

DEATH-RATES PER 100,000 POPULATION FROM CHRONIC DISEASES OF HEART, ARTERIES, AND KIDNEYS, 1900–1912, IN NEW YORK CITY.

(For purposes of comparison, tuberculosis (all forms) and typhoid rates are also charted.)

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
Tuberculosis	280	264	243	246	250	240	246	238	227	214	210	205	193
Heart	112	130	133	126	128	128	133	168	159	148	143	160	174
Bright's	141	153	148	146	157	147	146	130	112	113	116	101	110
Other circulatory	86	85	83	84	92	91	87	82	79	73	73	77	69
Typhoid	21	20	21	17	17	16	15	17	12	12	12	11	10

TABLE III.

COMBINED DEATH-RATE FROM ORGANIC HEART AND BRIGHT'S DISEASE NEW YORK CITY—PER 100,000 LIVING. 1868–1912.

1868	135.0	1879	186.5	1890	248.1	1901	283.1
1869	138.7	1880	180.5	1891	265.4	1902	281.1
1870	157.5	1881	199.0	1892	253.0	1903	272.0
1871	184.1	1882	212.2	1893	253.1	1904	284.0
1872	190.3	1883	219.1	1894	223.8	1905	275.0
1873	176.8	1884	208.2	1895	230.4	1906	279.0
1874	166.0	1885	214.0	1896	240.9	1907	298.0
1875	181.3	1886	216.0	1897	227.0	1908	271.0
1876	181.3	1887	212.7	1898	243.1	1909	266.0
1877	162.8	1888	198.8	1899	245.3	1910	259.0
1878	174.2	1889	238.2	1900	253.2	1911	261.0
						1912	284.0

TABLE IV.

DEATH-RATES PER 100,000 FORMER CITY OF NEW YORK (MANHATTAN AND THE BRONX) AND FORMER CITY OF BROOKLYN (BOROUGH OF BROOKLYN).

(From Annual Report, 1912, Department of Health, New York City.)

Year.	Heart disease.	Bright's and nephritis.	Year.	Heart disease.	Bright's and Nephritis.	Year.	Heart disease.	Bright's and nephritis.
1868	.....	64.0	1883	231.8	168.0	1898	383.7	392.9
1869	.....	71.4	1884	235.8	167.0	1899	368.2	436.3
1870	.....	78.7	1885	252.7	180.2	1900	379.7	464.1
1871	.....	94.7	1886	262.7	188.5	1901	462.6	484.8
1872	.....	116.5	1887	293.1	178.5	1902	491.7	479.0
1873	.....	108.7	1888	282.2	201.4	1903	485.0	507.4
1874	.....	105.6	1889	300.3	259.0	1904	510.1	530.9
1875	.....	90.9	1890	301.7	291.6	1905	509.8	515.9
1876	.....	95.8	1891	345.6	310.9	1906	560.3	530.7
1877	133.1	125.1	1892	359.7	303.0	1907	676.7	524.6
1878	153.1	125.1	1893	354.8	313.1	1908	663.9	465.5
1879	167.0	134.5	1894	329.7	307.8	1909	732.3	506.3
1880	163.0	135.6	1895	360.2	340.6	1910	775.3	519.8
1881	178.4	160.1	1896	377.4	364.3	1911	736.2	471.1
1882	196.3	172.2	1897	352.2	350.2	1912	814.6	522.1

While Table IV shows a similar increase in the total heart disease rates, as was manifested in those for the chronic form alone in Table I and II, it is noteworthy that the combined Bright's and chronic heart rate, as tabulated in No. III, loses its impetus in 1901, evidently from the effect of the diminishing chronic nephritis rate of that and subsequent years. As the net result of the examination of these tables we may conclude that Bright's disease mortality is about stationery or diminishing over the national registration area and in New York City; and that arterial disease, while perhaps lessened in New York City, owing to particularly effective measures taken against infectious disease, is still slightly on the increase generally, while in regard to chronic affections of the heart, the rate tendency throughout the country is distinctly upward. Abroad, according to the Registrar-General's figures, the mortality rate in England and Wales from all three of the diseases in question, has for some years been either stationary or has slightly diminished—the rates being, 1912 report, organic heart disease, 133, other circulatory (plus cerebral hemorrhage), 100, Bright's 35, all, particularly Bright's, being much below those of the United States. In Australia (well known for its general low morbidity and mortality rates) while the Registrar does not give the Bright's and other circulatory rates, the yearly

report for 1911 shows a mortality from chronic cardiac affections of 109. As well as I can ascertain, the general European rates, covering Germany and France, approximate those of the United States Mortality Statistics, as regards total heart affections and renal disease, and although the stress of business life may be much greater in this country, the general consumption of alcoholics in the foreign area is so much greater as to fully balance the account.

Insurance company "regular line" mortality statistics are well represented in the three following tables, giving the experience of the New England Casualty Company quoted from Dwight (*Boston Medical and Surgical Journal*, Oct. 26, 1911):

TABLE TO SHOW RELATIVE IMPORTANCE.

Cause of Death.	*Per cent.*
Chronic heart disease	13.25
Arterio-sclerosis	11.25
Nephritis	9.25

TABLE TO SHOW INCREASING PREVALENCE.

Deaths from circulatory disease. Percentage of total deaths.	*Period.*
10.5	1844–54
15	55–64
25	65–74
34	75–84
40.5	85–94
43.75	95–1904
45.75	1905–1910

TABLE TO SHOW GENERAL DISTRIBUTION. 1904–1910.

Deaths from circulatory disease. Percentage on total business written.	*Area.*
27	North Central States
26.83	New England
23.16	Mid-Atlantic States
23.00	Western States
21.25	Southern States

Brown (*Journal American Medical Association* Oct. 24, 1908) quotes insurance statistics to show that out of

TABLE V.

DEATHS BY SEX AND AGE-PERIODS, U. S. REGISTRATION AREA, 1912.

Age.	Organic heart.		Other circulatory.		Bright's.		Totals.		All.
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	
Under 20	1,886	2,011	1,228	1,097	785	788	3,899	3,896	7,795
20–39	3,948	3,922	2,344	2,069	2,938	2,971	9,230	8,962	18,192
40–59	11,495	8,980	9,725	7,556	9,852	7,221	31,072	23,757	54,829
60–79	23,044	19,707	20,448	17,190	14,847	10,773	58,339	47,670	106,009
Over 80	5,254	5,831	6,250	6,610	3,192	2,447	14,696	14,888	29,584
Not given	68	33	37	26	29	22	134	81	215
Totals	45,695	40,484	16,461	12,367	31,643	24,222	117,370	99,254	216,624

TABLE VI.

SAME, NEW YORK CITY, 1912.

Age.	Organic heart.		Other circulatory.		Bright's.		Totals.		All.
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	
Under 20	238	278	89	99	48	30	375	407	782
20–39	611	617	206	153	356	299	1,173	1,069	2,242
40–59	1,615	1,310	648	508	1,098	890	3,361	2,708	6,069
60–79	1,768	1,814	1,020	948	1,053	1,062	3,841	3,824	7,665
Over 80	269	370	187	283	155	183	611	836	1,447
Totals	4,501	4,389	2,150	1,991	2,710	2,464	9,361	8,844	18,205

(As before, I have included cerebral hemorrhage in "Other Circulatory.")

9,592 selected risks, 1,255 (over 13 per cent.) were lost from cardiac disease.

Table V and Table VI are offered to show the sex and age distribution of the mortality from diseases under consideration, in the registration area and in New York City. In the registration area it is seen how the sex incidence is approximately the same until the age period, 20 to 39, is reached, when divergence begins and maintains during the periods of active life. The same is seen to be the case in New York City, only that marked difference only begins at the next higher age period, 40 to 59.

Of 640 general autopsies, made between 1900 and 1905 on all classes of cases, 61, or nearly 10 per cent. showed organic heart lesion (Cheney, *Journal American Medical Association*, Aug. 26, 1905).

Prevention.

Having recognized the etiological factors of these diseases, the first consideration in the way of prevention is to do what we can to remove the predisposing cause, both from the community at large as well as from the particularly threatened individual. General hygiene, of course, extending even to infancy, and perhaps to eugenics, must be our main general reliance, and since no one later than the time of Don Quixote has been as fortunate as Sancho Panza in having a special group of scientists in attendance to arrange every particular of his daily routine, public health education in the general principles of hygiene and prophylaxis is essential that everyone be qualified to avoid at least the main pitfalls which continually threaten his welfare. The restriction and elimination, if possible, of infectious disease, such as scarlet fever and syphilis, rheumatism, both acute and chronic, must ever be a main point, since these maladies are so powerful in the premises, etiologically.

All measures necessary to prevent trade poisoning, as from lead, mercury

and arsenic, must be taken, and the individual and community instructed as to the actual rôle of alcoholics and tobacco in the production of such conditions.

Above all, a correct standard of diet, outdoor exercise, and limitation of nervous strain must be inculcated, with a full understanding of the principles involved, and sight should never be lost of the all powerful and disastrous effects of all agencies which act to produce prolonged increase in arterial tension.

The particular danger of employing the powerful stimulants available (alcoholics, tobacco, coffee, etc.) to further drive a circulatory system physiologically demanding immediate rest, should be made plain, as well as the injurious effects of the sedative coal tar and other drugs, when used habitually.

The public must be taught how overalimentation works to poison the system, and be induced to reduce the surfeit of food products, especially meat so frequently ingested. Although "autointoxication" is widely recognized, yet very few individuals ever do anything to avoid or reduce it beyond an occasional gulp of sour milk or a dose of salts, so public instruction as to the physiological requirements of the gastro-intestinal tract must be given.

Individual prophylaxis, apart from the above, consists in correcting as far as possible, any abnormal departures in daily routine or habits, from the hygienic, paying especial attention to any particular point in which the person under consideration seems to be weak, or his health to be menaced. For this purpose periodical medical examination is essential, since very few of the beginnings of these wear-and-tear diseases are noticeable to the patient—sometimes not to the medical man. The value of such examinations to the individual concerned, is well shown in the subjoined table presented in 1913 to the section on social and economic science of the American

ANALYSIS OF RISKS FOUND IMPAIRED. FREE ANNUAL HEALTH BUREAU EXAMINATIONS.

Average age, 49 years 9 months.
Amount of insurance $1,590,635.

Diseases.	Ages 20–30.	Ages 30–40.	Ages 40–50.	Ages 50–60.	Ages 60–70.	Ages 70 over.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Affections of heart, blood vessels and kidneys, diabetes	4.98	13.85	21.65	31.60	23.37	4.54
Per cent. at each age-period unaware of such impairment	65.21	57.81	63.00	60.27	56.48	57.14

Association for the Advancement of Science, at Cleveland, by Doctor Fisk, of the Postal Life Insurance Company. From this it will be seen that an average of 16.66 per cent. of these individuals examined that were found to suffer from the diseases catalogued, were unaware of the condition, and since a certain per cent. must have presented themselves as a result of symptoms, the incidence of these conditions among the same classes at large must be greater.

As a very few cases of circulatory disease are probably produced by overtraining and excessive physical exertion, due warning of such dangers should be given, and every individual necessarily so exposed should be physically examined to determine his freedom from predisposing tendencies, so far as may be discoverable. This plan is now followed in the public schools of New York City where every boy before being permitted to engage in athletic contests must be examined and passed by a School Medical Inspector.

To recapitulate—The prevention of chronic cardiac, arterial and renal disease lies in intelligent regulation of work, diet, rest, exercise, and the avoidance of unnecessary debilitating influences, such as dissipation (alcoholic, sexual, etc.), excessive nervous excitement, extreme overwork or exposure to cold, and the prevention of infectious diseases. In those cases where such diseases are contracted, early and careful treatment is necessary till recovery is complete, and dangerous complications escaped. Education of the public to this effect, together with methodical and periodical physical examinations of everyone to discover early symptoms or tendencies, in order that appropriate means may be taken, that the ounce of effective prevention may save the often wasted—because useless—pound directed to fruitless attempt at cure, would undoubtedly make far more headway against the wear-and-tear diseases which we are considering than the activities of the last thirty years have against tuberculosis.

Detailed Plan for Public Education.

First, in the nature of a survey, any specific factors peculiar to the city, affecting the health of its population, should be learned, social, industrial or what not.

All agencies in the field that are engaged in similar work should be studied to determine what they had accomplished, and the extent to which it would be practicable to coöperate with them. As to specific education:

Beginning with the young and most receptive elements, efforts should be directed to induce the school authorities to so modify the present course of physiology and hygiene as to impart more practical knowledge of the individual's welfare and the manner in which health can be maintained and disease avoided, particularizing the manner in which infectious disease is spread and all those evil effects so powerful cumulatively of bad habits.

Courses of lectures should be organized with a staff of specially qualified health workers, such as may be obtained within the department of

health or from volunteer outsiders who have had fitting experience and possess the necessary ability, so as to give at least one talk weekly during school hours in the assembly room of each and every public school in the city. This lecture system should form part of a regular school course, and an examination should be held by the educational authorities at the end of the term, covering the subjects gone over. Lectures should be illustrated by lantern slides, and at least once a week an appropriate moving picture show should be given in the school possibly Friday or Saturday evening.

Leaflets of instruction should be printed, covering daily habits, the way to keep well, the manner in which infectious disease is spread, etc., in the form of terse "Don'ts" or "Dos" for instance, and regularly distributed to all. For the higher grades and high schools more comprehensive circulars should be issued.

The same staff of lecturers could be employed to address meetings of parents. One such lecture should be held at least every week in each school throughout the school year. Similar lectures should be given to labor and employer organizations, with elaboration to cover the special industrial factors involved. It should be made generally known, through the press and otherwise, that the services of the lecture bureau are at the public's command to supply capable speakers on public health topics on all suitable occasions everywhere.

The course of lectures, should comprise (1) the reasons and objects of the lectures, (2) general information in regard to physiologic and pathologic processes, (3) special talks on general hygiene, injurious habits, etc. How one grows, avoids sickness, takes sick, gets well or dies, should be particularized and the way in which the wear-and-tear diseases develop, their causes and means to avoid them, all should be made plain. Lectures to adults should, in addition, illustrate particularly the etiological factors operative in adult life which predispose to and cause the diseases under consideration. The dangers of quack medicines should be emphasized, as well as the risk of self medication.

For distribution gratis, perhaps as cost price, an almanac or a substitute for the Self-Doctor Book so common in some households should be compiled. It should contain similar information to that imparted at the lectures, and graphic charts of the havoc played by chronic heart arterial and renal disease, and have illustrations, after the manner of posters. It should be attractively printed and suitable for preservation.

A weekly bulletin should be issued in absolutely popular form, and should, together with other health topics, cover specifically the wear-and-tear diseases, giving each subject local and timely color. This bulletin should both be distributed in the school (that beside children, stay-at-home parents may be reached— at lectures, and advanced copies should be sent to the local press. The effects of alcohol and the venereal diseases in maiming and shortening the individual's life should be thoroughly covered in this publication.

Effort should be made to induce the newspapers and popular magazines to feature articles dealing with the diseases in question, particularly from the standpoint of the Chinese doctor, "I teach how to remain well," and coöperation in furnishing information, suggestions and even copy matter should be offered to the editors. Timely, special press bulletins should be regularly sent to all papers, to at least tempt reproduction in their columns.

Special popular-form pamphlets on heart disease, arterial diseases and chronic nephritis, and one on the general advantages of periodical physical examinations for the well, should be prepared and distributed broadcast, with the other literature prepared. The entire field of the etiology prevalence and prevention of these diseases must be covered in concise, interesting and convincing terms, and it must be made plain to each reader, entirely well though he may be at the time, how vitally his future welfare may be influenced by heeding the warnings given.

Attractive billboard posters in popular form, of local and seasonable interest when possible, and street car advertising cards, "with a punch," should be printed covering the main principles of the prophylaxis of these diseases and displayed in appropriate places. New designs should be issued to replace the old each month.

A suitable exhibit could be rigged up on a motor truck or ambulance, arranged so that the people in the street or a surrounding crowd, could inspect it, and the truck should make visits to squares, markets, factory entrances (at noon hour), etc. Pamphlets and leaflets pertaining to the work should be carried and distributed.

An especially efficacious way in which public health literature might and should be circulated, is through an agreement with the Sunday papers. Arrangements to permit such leaflets to be inserted each week in all copies of their publication sold might be made.

In all educational efforts the assistance and coöperation of organizations working to the same and similar ends should be sought, and Sunday schools, churches, clubs, etc., should be invited to aid. Such organizations, as well as the insurance companies, would be effective agents to further the distribution of literature, especially to furnish names to which to send the weekly bulletin.

Appropriate moving picture shows should be staged and the films regularly lent to the various amusement resorts of the city, and used in various places of public assembly. The advantages and need of periodical, yearly, physical examinations for the well should be well advertised in all lectures, prints and press bulletins, and what has been discovered and accomplished already by such methods must be shown. With this end in view an association of existing dispensaries, after investigation and approval of their facilities, similar to the allied tuberculosis clinics, should be negotiated, and their services offered to that portion of the public whose finances did not permit them to pay for the yearly examination recommended. Or, of

course, the health department could directly undertake this work. The interest of large corporations should be solicited in regard to the prophylaxis of these maladies and they should be supplied with the special printed matter for distribution, and urged to encourage or to institute regular physical examinations of their entire personnel.

Small special exhibits beginning with the various features of the causation, prevalence and workings of the maladies in question, should be prepared and sent to schools, private organizations, museums, libraries, municipal ferryboats (for exhibition) and other places where large numbers of people are apt to view them. A large wear-and-tear disease exhibit should be held yearly or even be made permanent after the fashion of the American Museum of Safety.

It would be well to hold, with the coöperation of interested agents, perhaps once yearly, a wear-and-tear disease parade in order to further advertise and interest the public in the measures in hand. This should particularly show the need and the objects of the work, besides the results already accomplished.

THE RESULTS OF STUDIES UPON THE DUST AND BACTERIA CONTENT OF THE AIR OF CITIES.

MELVILLE C. WHIPPLE,
Instructor in Sanitary Chemistry, Harvard University, Cambridge, Mass.

Read before the Laboratory Section of the American Public Health Association, Jacksonville, Fla., December 3, 1914.

DURING the past two years it has been the privilege of the author to carry on several lines of investigation having to do with the nature of the substances that cause the air of cities to be unclean, their quantity under different conditions, and the natural and artificial means available for their removal. An important part of the work was a quantitative study of the dust and bacteria, impurities of the atmosphere which represent the accumulation of dirt and filth incident to urban life. The study was facilitated by recent improvements in methods and apparatus, and was undertaken partly with the idea of determining the limitations of the apparatus which was employed.

In view of the fact that there is only a small amount of published information which gives reasonably accurate figures for the numbers of dust particles and bacteria in the air, this paper is presented as a compilation of the results obtained over a fairly wide range of conditions. Although the investigations were not broad enough in their scope to be complete in every detail, it is felt that they have furnished a definite idea of the actual amount of certain impurities in the air. Opportunity has also been given to observe where some of the present methods of sampling and examination may be improved.

Some very thorough and conclusive work has been presented in recent years to show that the danger of infection by pathogenic bacteria carried through the air for any considerable distance is very slight in the majority of places occupied by human beings. The work of Chapin on droplet infection, and of Winslow in the schools of New York City are notable in this field, and have been generally accepted as representing the true conditions. In this paper only the total numbers of bacteria are dealt with. No studies of species have been made. Inasmuch as the chances for the presence of harmful forms may be said to increase when the total number increases, it is felt that a knowledge of the latter provides some idea of the comparative safety of different atmospheres. At least it indicates the presence or absence of a clean environment which under the teachings of modern hygiene is of itself a desideratum.

Dust in the air we breathe and its physiological influences are not well understood. We know that respiratory diseases are aggravated by very dusty atmospheres and we try to place patients suffering from them in localities where the air is clean. We know the way in which the air passages and lung cells of subway workers and others in dusty trades become coated with fine particles. But we do not

know to what extent the body ignores this state of affairs, or how great may be the quantity of dust inhaled under varying body resistances without ill effects. Nor do we know whether coarse or fine particles are most injurious, whether the greater danger is in the upper air passages or in the delicate lung cells. There are those who believe that dust is ordinarily of little consequence and behaves as an inert substance when once deposited. It would seem, however, that the larger gritty particles, when lodged on delicate mucuous surfaces, must irritate and even rupture them, preparing the way for chance infection to enter. We know how even a small quantity of dust causes sneezing and irritation in the case of people whose nasal passages are extremely sensitive. Furthermore, dusty atmospheres are dirty atmospheres and most dirt increases the danger from bacteria. We have learned, it is true, that not every dust particle is the carrier of bacteria, but some of them are, and with increasing numbers of dust particles the danger becomes greater. Dust prevention, therefore, merits consideration in the establishment of a clean environment.

For securing samples of air for dust and bacterial analysis the device manufactured by Wallace and Tiernan, 136 Liberty Street, New York City, has been used. It consists of a wooden box 9″ x 12″ x 8″ within which is either a direct or alternating current motor that operates on any 110-volt circuit. A small pump is operated by the motor and this draws in air from the outside of the box through a glass adapter tube that fits into a metal receiving cup. A tight joint is made by means of a rubber gasket. The adapter tube contains a half-inch layer of sand for the retention of bacteria and this is later washed out from the tube with sterile water. For the collection of dust particles a half-inch layer of resorcinol crystals is employed. The crystals are later dissolved in perfectly clean water and counted under the microscope with the use of a 16 mm. objective. Particles from one micron upward can be enumerated in this way. The employment of this method calls for extreme care and scrupulous cleanliness in the preparation of apparatus and the subsequent procedure. Consistent results cannot be obtained unless such precautions are taken.

Much has been written concerning the proper regulation of temperature, humidity and air movement in occupied rooms. We have come to think that the derangement of these factors is responsible in a large degree for our feelings of dullness, stuffiness and general discomfort after a more or less protracted stay indoors. These symptoms are not only apparent after confinement to poorly ventilated rooms but occur to a degree in rooms where ventilation is thought to be fairly good.

Relief is nearly always gained upon going into the outside air. Here the physical conditions are so different that it is possible they all operate beneficially, but it has occurred to the writers that the influence of dust in this connection is one that may have been given too little weight in the consideration of ordinary atmospheres. We are all familiar with the dryness

and parched feeling imparted to the respiratory passages by breathing very dusty air. In a milder degree, this effect is also produced in occupied rooms. Deficient humidity is generally ascribed as the cause, but may it not be that small floating particles of dust, originating from clothing, dirt and abrasion of various articles, also produce effects similar to those of unduly dry air? These particles are kept in motion by various disturbances within occupied places, are usually in a desiccated condition, and have the property of abstracting water from moist surfaces upon which they may lodge. Operating in this way the inhalation of dusty air for several hours may produce to a degree the same unpleasant dryness of the throat and nasal passages that results from breathing very dry air and in addition causing a slight irritation. If so, a more widespread use of some process of air cleansing, such as air washing, is to be highly commended.

How well founded this conception may be is clearly a question for discussion in the absence of any knowledge bearing directly upon the subject. It is possible to show, however, that outside air is nearly always freer from dust than inside air. Examination of dust by the method already outlined, using the microscope, does not reveal the presence of particles smaller than about 1 micron, .001 mm. This is unfortunate, as it may be that different atmospheres vary greatly in their content of particles smaller than this, particles that might almost be said to be "colloidal" in size. Likewise those atmospheres that are most sought for by mankind, in the belief that there are benefits derived from life in them, are cleaner than those that envelope populated communities. Determinations of dust made by the writers in the summer season showed 18,000 particles per cubic foot in the air over Long Island Sound, 27,000 at the fifty-seventh story of the Woolworth Building in New York City at a time when the street air showed 221,000, and 25,000 particles after a heavy summer shower in Cambridge, Mass., where the normal dry weather content was 200,000 or over. Attention is called to the close agreement between these three determinations, representing as they do the dust in air under conditions of obvious cleanliness.

In Table I are given the results of several determinations of dust and bacteria made in a small fresh air school in Cambridge, Mass. There were two rooms, one for kindergarten instruction, the other for first grade work. The dimensions of the first were 21′ x 40′ and of the latter 10′ x 31′. Ceilings were 13′ high. There was no mechanical system of ventilation and air was taken into the room through several large windows and transoms, principally the latter, along one side of each room. A temperature between 50° and 60° F. was maintained throughout the winter. In each room there were about twenty small children and the teacher, the unit volume of air space accordingly being about 500 cubic feet per person in the kindergarten and 200 cubic feet in the first grade.

In all cases the dust particles and the bacteria were more numerous in

TABLE 1.

SUMMARY OF ANALYSES OF AIR MADE AT LAWRENCE HALL SCHOOL.

Date 1914.	Dust particles per cu. ft.			Bacteria per cu. ft.					
				Gelatine at 20°C.			Agar at 38°C.		
	Outside air.	Kinder-garten.	First grade.	Outside air.	Kinder-garten.	First grade.	Outside air.	Kinder-garten.	First grade.
Jan. 8	—	—	140,000	—	—	16	—	—	7
Jan. 16	68,000	185,000	228,000	3	43	27	0	7	13
Jan. 28	98,700	107,000	147,000	0	27	50	0	8	15
Feb. 26	264,000	311,000	363,000	10	10	20	0	13	33

Carbon dioxide determinations made on Jan. 28 gave the following results:

Outside air = 3.5 parts per 10,000.
Kindergarten = 4.25 parts per 10,000.
First grade = 5.0 parts per 10,000.

TEMPERATURE AND HUMIDITY READINGS.

Date 1913–14.	Outside air.			Kindergarten.			First grade.		
	Tem-pera-ture F°.	Rela-tive humid-ity.	Abs. humid. grains cu. ft.	Tem-pera-ture F°.	Rela-tive humid-ity.	Abs. humid. grains cu. ft.	Tem-pera-ture F°.	Rela-tive humid-ity.	Abs. humid. grains cu. ft.
Dec. 12	33.0	60%	1.316	57.5	39%	2.059	56.0	40%	2.006
Dec. 18	42.5	75	2.340	63.0	45	2.857	58.0	52	2.792
Jan. 8	36.0	60	1.474	50.0	39	1.590	49.0	40	1.574
Jan. 16	26.0	73	1.185	60.5	30	1.753	56.0	35	1.756
Jan. 28	45.5	79	2.746	59.5	50	2.825	57.5	53	2.798
Feb. 13	12.0	47	.402	60.0	15	.861	—	—	—
Feb. 26	35.5	28	.662	62.0	16	.982	58.5	21	1.148

the air of the rooms than in that of the outside air, varying, no doubt, with the amount of disturbance in each room. Likewise, with one exception, the first grade room showed higher counts than the kindergarten room. The smaller volume of air per occupant in this room accounts for this fact. The actual number of children was about the same.

These results are given merely as an illustration of the greater numbers of bacteria and dust particles that are present in the indoor air of one class

of occupied rooms. The numbers are not excessive for schoolrooms, and are in fact considerably lower than the average results obtained by Winslow in the New York City Schools.* This might be expected, as one of the advantages of a fresh air school, the object of which is to provide a rapid change of air between the inside and outside atmospheres.

An interesting sidelight upon this particular fresh air school is the fact that the teachers went through the entire winter without colds, although they had been subject to them in previous years while teaching in the ordinary schoolrooms where mechanical systems of ventilation and higher temperatures were in use. The cool temperature of the rooms, as shown in the table, may have been quite as much of a factor as was the ventilation in maintaining the good health tone. It is of course impossible to separate the effects of the two from any work done by us.

How best to improve atmospheric conditions in the basements and subsurface floors of buildings has long been a problem with department store proprietors. It has been hard to approach the improved standards applied to the upper floors owing to the fact that mechanical means must be employed to change the air, and these must be on a scale larger than ordinarily used because of the great volumes of air to be handled, the absence of air movement below the street surface, the heat radiated from artificial lighting, and the larger crowds that frequent the basement departments.

Table II gives the results of some studies in a large Boston store where considerable attention has been given to the ventilation of the basement floor and the mezzanine floor just above it. The latter is described in the table as the "basement balcony." Washed air taken from the roof is supplied to these floors. It does not furnish the entire supply, however, as the exhaust system handles a volume several times larger, the difference being made up by leakage inward from stairways, wells and other openings.

The number of dust particles at various places in the basement was considerably higher than in the incoming washed air or the outside air. Microscopical examination showed that many of the particles were of fibrous structure. The handling of clothes and dry goods and the contact of large numbers of people in passing about the store would naturally give rise to a considerable amount of dust of this character.

There was a striking difference in the numbers of bacteria in the washed air and that in the store. A considerable increase was shown both in the forms growing at 20° C. and those growing at 37°.

It will be seen that the figures given for the store in Table II exceed those given for the fresh air school in Table I. This serves as an illustration of the way in which indoor air becomes unclean by use, the degree depending upon the extent of usage and the frequency of change. The basement referred to above had an elaborate installation for renewing its atmos-

* School Ventilation in New York City. C.-E. A. Winslow, American Journal of Public Health, Vol. 3, No. 2, 1913.

TABLE II.

SUMMARY OF ANALYSES OF AIR TAKEN FROM THE BASEMENT AND BASEMENT BALCONY IN A DEPARTMENT STORE, BOSTON. APRIL 3, 1914.

Hour.	Location.	Bacteria per cu. ft.		Dust particles per cu. ft.	Relative humidity.
		Gelatine at 20°.	Agar at 38°.		
11.00 a.m.	Intake of air washer	33	3	137,000	50%
11.30 a.m.	Washed air from washer	17	3	68,000	61
1.05 p.m.	Basement, N.E. corner	150	10	262,000	34
1.45 p.m.	Basement, N.W. corner	200	53	423,000	33
2.10 p.m.	Basement, south side center	223	67	476,000	29
3.00 p.m.	Balcony near stair well	160	23	321,000	35
3.30 p.m.	Balcony, S.W. corner	90	10	388,000	27

TEMPERATURE AND HUMIDITY READINGS.

Hour.	Location.	Temperature.		Per cent. rel. humidity.	Remarks.
		Dry bulb.	Wet bulb.		
11.10 a.m.	Intake of air washer	54.5°	46.0°	50	Air taken in at roof
11.30 a.m.	Washed air from washer	58.5	51.5	61	Sample in duct
1.05 p.m.	Basement, N.E. corner	60.5	47.5	34	Near freight elevators
1.45 p.m.	Basement, N.W. corner	70.0	54.0	33	Near Exit CC.
1.55 p.m.	Basement, S.W. corner	70.0	53.5	31	Near Exit DD.
2.15 p.m.	Basement, south side center	72.0	54.5	29	Ladies' suit department
3.05 p.m.	Balcony, near stair well	73.0	57.0	35	North side
3.15 p.m.	Balcony, near restaurant	74.5	58.0	34	South side
3.30 p.m.	Balcony, S.W. corner	69.5	52.0	27	Near Exit DD.

phere and was fairly comfortable as to temperature and humidity. The ventilation system did not accomplish as perfect results, however, from the standpoint of air cleanliness. The figures given for dust and bacteria are slightly in excess of the average results given by Winslow for New York City schools.

During the routine of life in large cities there is probably no other place where the population mingles in closer personal contact, or under more abnormal conditions of ventilation, than in the cars of our transportation systems. This is the outcome of numerous causes, such as the rapid growth of certain communities, which overtaxes transportation facilities, the willingness to sacrifice comfort for speed, and the small amount of attention that has been given in years past to a

comprehensive study of existent conditions and means for their improvement.

The air in street cars is subject to unusual contamination from two sources, first, from the large number of persons occupying a given cubical space and second, from the streets over which the cars pass. The constant boarding of passengers brings upon the floor of the car a large amount of street dirt, which is dried and scattered about by the strong air currents. The rapid motion of the car over the streets lifts large volumes of coarse and fine material from the roadway and this is brought into the car in clouds when the speed is decreased and doors and windows are opened.

With the idea of obtaining information relative to the dust and bacteria content of air in street cars, some studies were made on the line of the Boston Elevated Railway Co. running between Harvard Square in Cambridge and Pleasant Street in Boston. The studies were in the nature of a preliminary investigation, and were made possible through the courtesies of Major-General Bancroft, President of The Boston Elevated Railway Co., Mr. M. C. Brush, Chief of Transportation, and Mr. C. H. Heil, Chief of Maintenance, to whom acknowledgment is made for the privilege of using the cars and equipment of the Company. The results are given so far as obtained, and are of interest as showing the conditions at the particular time and place at which determinations were made.

The line in question extends over four miles of the Boston Elevated Railway system, approximately half

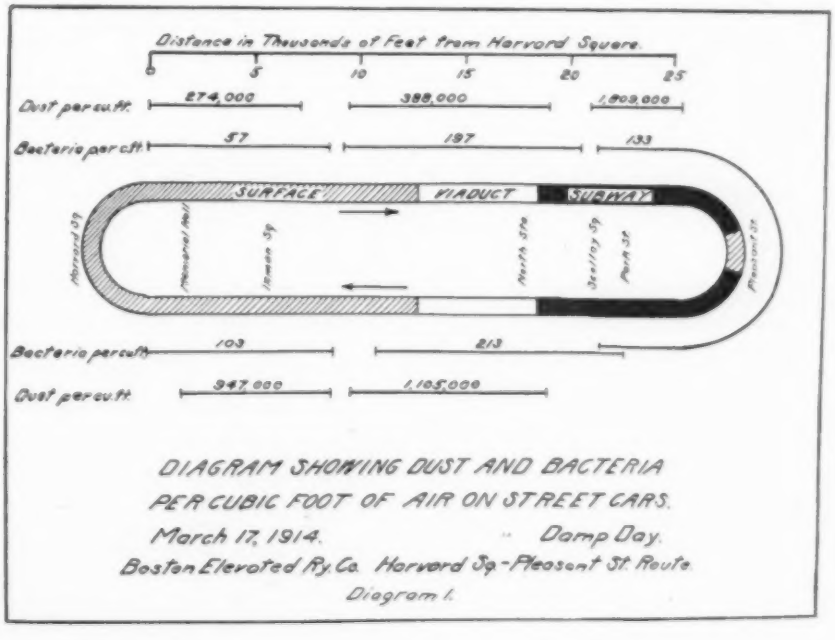
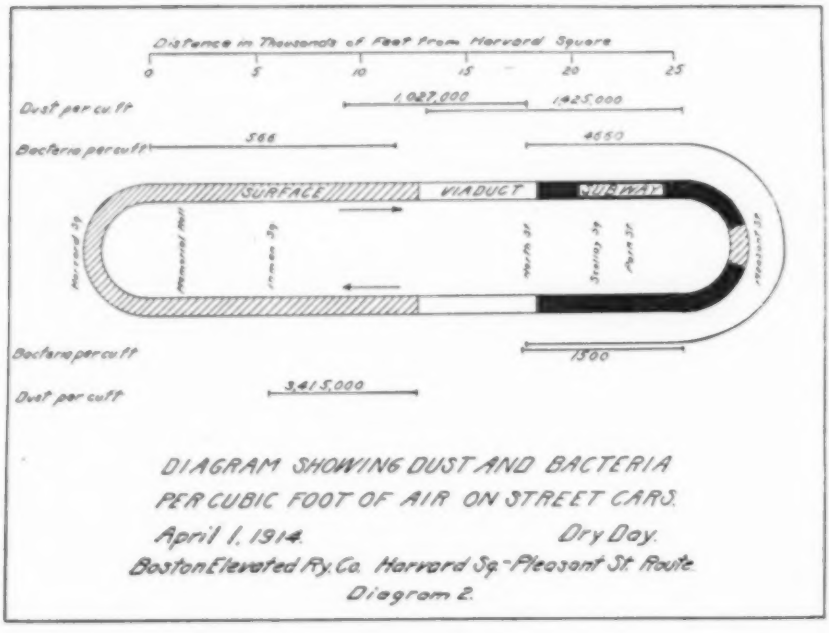


DIAGRAM SHOWING DUST AND BACTERIA PER CUBIC FOOT OF AIR ON STREET CARS.

March 17, 1914. Damp Day.

Boston Elevated Ry. Co. Harvard Sq.-Pleasant St. Route.

Diagram I.



of the distance being surface line, the balance being divided between one of the Boston subways and a long viaduct passing over the Charles River and a portion of Boston. The cars in use were the large semiconvertible type, known as 4A2 and having closed vestibules and cross seats with a center aisle. Air was admitted to the cars by means of two deck-sash ventilators at either end, and by means of twelve curtain ventilators along the roof of the car, six of which were always open, the remaining ones closed. Samples of the air were collected at the center of the car. The results of analyses for dust particles and bacteria are given in Table III and are shown graphically in Diagrams 1 and 2. From eight to ten minutes was required for the taking of each sample, during which time the car was moving. The portion of the route over which the car moved during the taking of each sample is indicated in the diagram and in the tables the maximum and minimum numbers of passengers are given for each portion of the route.

Diagrams 1 and 2 show the route over which samples were taken, the character of the route at different points, and the approximate distances between stations. The figures for bacteria and dust appear above and below the representation of the route, and the line under each of them indicates the distance over which the sample was taken.

Comparison of the two diagrams shows a decided difference in the number of bacteria and dust particles on a damp and on a dry day, the latter

showing the higher results. The figures presented are much higher than those given for samples collected in other places mentioned in this paper. In one case the dust particles numbered 3,415,000 per cubic foot. This was in a section of Cambridge where a large force of men was engaged in removing the winter's accumulation of street dirt.

Judging from the rather limited number of determinations made, there is a tendency for the subway air to be less clean than the outside air over the streets. In general, higher results were obtained on portions of the route laying in the subway. The dust particles collected in the subway had a smaller average diameter and under the microscope were darker in color. The work of Soper in the New York subways has shown that a very considerable amount of metallic dust is present in subway air. This results from the wearing down of rails, wheels and brake shoes. Samples taken on the viaduct or in passing over it might be expected to give lower results on account of the greater purity of the atmosphere; but in passing from a rather dirty section of Cambridge in one direction, and from the subway in

TABLE III.

SUMMARY OF ANALYSES OF AIR

SAMPLES TAKEN IN CARS OF BOSTON ELEVATED RY. CO. HARVARD SQUARE—PLEASANT STREET LINE.

BACTERIA.

Section of route.	Bacteria per cu. ft.		Number of passengers.
	Gel. at 20°C.	Agar at 38°C.	
March 17, 1914.*			
Harvard Square to East Cambridge	57	43	7 to 35
Scollay Square to Pleasant Street and return	133	57	30
East Cambridge to Harvard Square	103	43	5 to 25
East Cambridge to Scollay Square	197	193	12 to 26
Park Street to East Cambridge	213	187	17 to 50
Outside air, Pierce Hall	33	17	—
April 1, 1914.†			
Harvard Square to East Cambridge	566	67	9 to 45
Pleasant Street to North Station	1,500	1,080	7 to 33
North Station to Pleasant Street and return	4,660	3,330	4 to 26
Outside air, Pierce Hall	117	10	—

* The streets on this day were damp from rain that had fallen a few hours previously.
† The streets on this day were dusty, following two days of dry weather and brisk winds.

TABLE III—*Continued.*

DUST PARTICLES.

Section of route.	Dust particles per cu ft.	Number of passengers.
March 17, 1914.*		
East Cambridge to Scollay Square	388,000	35 to 67
Haymarket Square to East Cambridge	1,105,000	25 to 30
Harvard Square to East Cambridge	274,000	5 to 19
Scollay Square to Pleasant Street	1,809,000	4 to 26
East Cambridge to Memorial Hall	947,000	20 to 40
Outside air, Pierce Hall	133,000	—
April 1, 1914.†		
Viaduct to Pleasant Street	1,425,000	7 to 54
Viaduct to Inman Square	3,415,000	19 to 30
East Cambridge to North Station	1,027,000	26 to 37
Outside air, Pierce Hall	122,000	—

the other direction, with doors and windows closed, there was a considerable lag in the change of atmosphere within the cars.

In connection with Table III it will be noticed that the dust and bacteria content of the outside air at Pierce Hall, as registered on the days when samples were taken in the cars, was very much lower. This might be expected when consideration is given to the agitation surrounding the movements of street cars and the amount of dust and dirt that is brought into them by passengers.

The variations from day to day in the dust content of city air in a place removed from the influences of car traffic is illustrated by the figures given in Table IV. The results are for an eleven day period following shortly after April 1, 1914, the date of the street car observations given in Diagram 2. A wide range of weather conditions is covered by the period. Each sample examined was a composite one made up by collecting the dust at three or four different intervals during the day.

In general the figures in the table show that dust particles were most numerous when the streets were dusty and the wind movement great. Exceptions to this occurred on April 8, a foggy day with no wind, and on April 12 and 13, when there were high winds and fair weather. It is an observed fact that on quiet days with high humidity conditions a large amount of soot and dirt is deposited from city

* The streets on this day were damp from rain that had fallen a few hours previously.
† The streets on this day were dusty, following two days of dry weather and brisk winds.

TABLE IV.

TABLE SHOWING NUMBER OF DUST PARTICLES IN OUTSIDE AIR ON DIFFERENT DAYS. HARVARD UNIVERSITY, CAMBRIDGE, MASS.

Dust particles per cu. ft. at Pierce Hall.*	Date.	8 a.m.		4 p.m.		Remarks.
		Wind.	Weather.	Wind.	Weather.	
	Apr. 2			Light E.	Clear to rain.	Streets wet. Snow at night
	Apr. 3	Light W.	Cold Clearing	Brisk N.W.	Fair	Freezing during night
280,000	Apr. 4	Fresh N.W.	Cold Fair	Fresh W.	Fair	Streets dusty after noon
116,000	Apr. 5	Light S.W.	Cold Cloudy	Fresh S.W.	Clearing	Light rain up to noon
177,000	Apr. 6	Light W.	Cold Fair	Light S.W.	Fair	Streets somewhat dusty
158,000	Apr. 7	Brisk N.E.	Cold Rain	Light N.W.	Cloudy	Streets very muddy
226,000	Apr. 8	V. Light N.W.	Cold Foggy	Light S.E.	Mist	Streets muddy all day
91,000	Apr. 9	Fresh N.W.	Mild Clearing	Brisk N.W.	Partly cloudy	Streets became partially dried
113,000	Apr. 10	Brisk W.	Cold Fair	Fresh S.W.	Fair	Streets dusty
366,000	Apr. 11	Brisk S. to High	Mild Fair	High S.	Fair	Very dusty day Light rain in night
139,000	Apr. 12	Brisk S.W.	Mild Fair	High N.W.	Fair	Not much dust until noon. Gale in late P.M.
121,000	Apr. 13	Brisk N.	Cold Fair	Fresh N.W.	Fair	
109,000	Apr. 14	Fresh S.W.	Cold Fair	Light S.W.	Fair	

atmosphere. This may explain the result for April 8. The low results of April 12 and 13 were coincident with a shifting of the wind to northerly directions and a lowering of temperature. This followed a very light rain on the night of April 11. The movement of large volumes of air from northerly points nearly always results in a clearing of the atmosphere in Cambridge.

The factor of street cleanliness is a most important one in connection with the purity of the air within cars and along the streets over which they operate. It is only necessary to stand in the wake of a rapidly moving car on a dirty street to realize how effectually large quantities of dry material are stirred up, drawn after the car and diffused in the path of others. The

* Composite samples taken at different hours of the day.

proportion of coarse siliceous particles in the air is very large at such times. This contributes an element of danger if the theory is tenable that large, rough particles cause abrasion and irritation of the mucous linings of the respiratory passages, and so prepare an environment more favorable for the growth of infecting bacteria if they are present.

It is within the power of any municipality to aid in the problem of car ventilation and as a matter of public health this becomes a duty. If principal thoroughfares are kept well cleaned or oiled, much is accomplished by this act alone toward furnishing a supply of clean air for the cars passing over them. The problem is then confined to the adjustment of conditions within the cars.

A general inspection of all the results presented in this paper shows that although the dust and bacteria contents of air in different places, both indoors and out-of-doors, vary from day to day, there are distinct differences that mark the increased cleanliness of one place over another. These differences are measurable by the methods that have been described. Outdoor air may be said in nearly all cases to be cleaner than the same air after use in occupied places. Its initial purity will depend upon two things, the source from which it is taken, and the meteorological conditions prevalent at any particular time. It is on account of these influences that care should be exercised in the proper location of air intakes for buildings.

The dust and bacteria in the air of occupied places has been shown to vary greatly with the character of the place. The amount is, of course, influenced by a great many factors. The cleanliness of inside air may be judged by the total numbers of dust particles and bacteria present, regardless of whether the increase over the numbers in the incoming outside air is large or small. If the increase is large, measures should be taken on the inside to reduce the numbers, either by supplying a larger quantity of outside air or by eliminating dirty conditions within. If the incoming air is unclean it should be subjected to some cleansing process, or else the source of supply should be changed.

The methods which have been described for the collection of samples and their examination for dust particles and bacteria were employed to obtain the information presented in this paper. In some ways they have been proved to be very satisfactory, but their use has been accompanied by limitations.

So far as apparatus is concerned, nothing elaborate or very costly is required except the motor and pump that are necessary for exhausting the sample of air. The mechanical features of these have been perfected to such a degree that almost no trouble is experienced in their operation. The laboratory apparatus required, such as sampling tubes, is quickly and easily prepared, and the routine examination is made with standard microscopical accessories.

Another limitation in the method of sampling is the time required for each determination, usually from six to ten minutes. In a great many cases this

is advantageous, as the dust and bacteria content of air is liable to vary from minute to minute and the increased time interval gives a more representative sample. There are places, however, where a very short, almost instantaneous, period is needed in order to give the desired information. This was illustrated by the work on street cars where considerable portions of the route were covered during the taking of one sample. As a consequence the samples represented average conditions for a number of minutes. It would have been desirable to have taken more frequent samples.

The necessity of having to use an electrically operated apparatus is, however, a serious drawback. There are many places where samples are required in which it is not permissible to use a mechanically driven apparatus on account of the slight noise produced.

The counting of dust particles requires painstaking care. Every piece of apparatus that touches the sample must be scrupulously clean, as dust particles are everywhere in the air. If anything, even greater care must be exercised to guard against outside contamination than in bacterial work, for dust particles far outnumber bacteria in the air. The actual process of counting under the microscope is somewhat laborious, as every particle in the field down to the limit of visibility must be counted. As previously mentioned, this limit of visibility is a serious obstacle in the way of studying the fine particles in air. It may be that there are wide differences in this regard between samples of air. Any method that will take into account these smaller particles will be distinctly in advance of present procedure. Until information is secured in this unknown realm we shall never have the whole story concerning dust and its effects. The size of the visible particles should also be taken into consideration in order to obtain an idea of the percentage of coarse and fine particles. With the use of the present method for estimating the total number of particles this would be a very laborious procedure.

The above investigation was made in the Laboratory of Sanitary Engineering of Harvard University under the general direction of Professor George C. Whipple, and was made possible by funds kindly furnished by Mr. Ernest C. Dane of Brookline.

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Secretary, Dr. H. D. Pease, New York City.	Secretary, Dr. W. F. Snow, New York City.	Secretary, Dr. E. R. Hayhurst, Columbus, O.

POLICEMEN AS SANITARY INSPECTORS.

It is apparent that health departments are realizing more and more the opportunity for a close coöperation between their departments and the police departments. The health department of New York City has recently been experimenting with the use of policemen as deputy health officers. The commissioner, Dr. S. S. Goldwater, has made the following pertinent remarks with regard to this experiment which it is planned to extend. "Of all the city employees, the policeman, from the very nature of his duty and the circumstances under which he works, comes into the closest personal relation with the people. He should be the first to notice insanitary conditions and to do his part toward their betterment, either by personal effort or by reports to other city departments charged with the control of such matters. Already the moral guardian of the community,

he should keep an eye on its health and surroundings." Commissioner Goldwater has quite wisely urged the policemen to do this work rather as a friendly neighborhood adviser than as the stern impersonation of the law. Necessarily the policeman has limitations as a health officer but it is obvious that, in connection with nuisances particularly, he does not require a great deal of training. In New York City arrangements are under way to include in the regular curriculum of the training schools for new policemen a course of lectures and instructions in health matters. It is obvious that in a very large number of our health departments there are insufficient inspectors to make the necessary frequent inspections of their districts. The greater the number of inspectors the greater the number of nuisances that will be discovered. The size of the policeman's beat is necessarily very much smaller than the district covered by a sanitary inspector.

It is true that some police commissioners are opposed to using any of their officers for the work of the health departments. Some commissioners state that their objection is based on the fact that it takes too much of their time, and that their services are required in the more important work of protecting the lives and properties of citizens; also for the reason that such inspections should be made by persons skilled in the laws of sanitation. It is certainly true that an ignorant or over-zealous police officer might occasionally do something which might get the health department in hot water. While this cannot be gainsaid, it seems obvious that with coöperation between the departments and with the proper instruction of the police officers, that the benefits would far outweigh the disadvantages. The editor of this JOURNAL in an article which appeared a couple of years ago in these pages summarized the four main advantages of such a plan of coöperation as follows: (1) Increase of efficiency of public service in the amelioration and prevention of nuisances, and a resulting cleaner and more decent city. (2) Health departments able to devote more of their time to health work and to bring about healthier communities. (3) The development of coöperation between police and health departments. (4) No added cost to city. There does not seem to be any occasion to alter the conclusions. Coöperation is a good slogan for health departments and is apt to mean more than economy and efficiency.

CONCERNING THE ROCHESTER MEETINGS.

The attention of members of the American Public Health Association is again drawn to the fact that although the Association meetings at Rochester do not begin until Tuesday morning, September 7, they are cordially invited to be present at the open meeting of the Fifteenth Annual Conference of the Sanitary Officers of the State of New York which is to be held on Monday evening, September 6, at eight o'clock. There will be addresses by Dr. Hermann M. Biggs, Dr. W. C. Gorgas, Dr. G. W. Goler and others. (See page 18 of the Preliminary Announcement which has already been sent to the members.)

"RELATIVE STABILITIES" IN POLLUTED WATERS CARRYING COLLOIDS.*

ARTHUR LEDERER,
Sanitary District of Chicago.

Read before the Laboratory Section American Public Health Association, Jacksonville, Fla., December, 1914.

AS a rule, all river waters contain more or less colloidal matter in the form of very finely divided silt. Polluted waters also carry colloids of sewage origin mainly derived from the fecal matter.

Only recently has the importance of colloids been recognized in sewage disposal and water purification. We know that the colloidal matter in sewage affects the putrescibility of the liquid more than the heavier coarse suspended matter. The removal of the colloids by simple filtration—not biologic filtration—results in an improvement which is however much less than the one effected by biologic treatment† but far more than by settling. The study of colloids has given the science of chemistry a new aspect. Colloidal chemistry has explained some phenomema in nature as well as technology, heretofore not clearly understood. We differentiate between crystalloidal and colloidal state of matter. A very large number of inorganic substances, heretofore known only in the crystalloidal state, have been prepared in the colloidal. Some substances such as proteins, starch, gum, and glue are known in the colloidal form only. Suspensions of colloidal clay remain suspended in the water for days and weeks. The addition of electrolytes such as common salt, sodium sulfate, calcium sulfate, or sodium nitrate, accelerates sedimentation. The reason for this is (1) the electrostatic attraction between the colloids and the ions carrying the opposite electrical charge; (2) the removal of the water of the colloid. Hygroscopic electrolytes are, therefore, particularly efficient. Colloidal clay adsorbs aniline dyes such as methylene blue. By adsorption we understand the concentration of a dissolved salt on a surface due to difference in surface tension or electric potential. Clays also adsorb and retain other substances such as oils, fats, starch, proteins, certain inorganic dyes, all aniline and plant coloring matter, urine and fecal matter, putrid odors, and a large number of other substances. This property of adsorption has led Professor Rohland of Germany to develop his clay treatment of sewage and industrial waste waters. Adsorption is selective. An interesting study on this point has recently been made by Parker.‡

When applying methylene blue to waters carrying colloidal suspensions of clay, the dye is adsorbed by the clay and sedimentation occurs, leaving the liquid colorless. The sediment is blue. This adsorption may be only partial; it may take place quickly or slowly, all depending upon the quantity and the character of the colloidal mat-

* Arthur Lederer, Chemist and Bacteriologist, The Sanitary District of Chicago.
† Lederer, AM. J. PUB. HEALTH, Feb., 1912. ‡ Parker, J. Ind. Eng. Chem., Oct., 1914, p. 831.

ter present. The adsorption interferes seriously with the quantitative determination desired on the degree of putrescibility of the liquid. In other words, "relative stabilities" obtained in such waters by the methylene blue method cannot be correct. Spitta and Weldert in their original communication* advise the observation of decolorization of the sediment after adsorption takes place, though their observations are more of a qualitative nature and in such cases the exact time element is of less importance. In obtaining Phelps' "Relative stabilities," the time element is all important.

Until recently the writer disregarded the decolorization of the liquid in polluted river waters, and accepted the decolorization of the sediment as the criterion. Correspondence between the writer and Dr. F. E. Hale of the Mount Prospect laboratory, Brooklyn, N. Y., developed a difference of opinion regarding the reliability of this procedure. Doctor Hale held that the methylene blue once thrown out of solution is probably inert, and that, therefore, the decolorization of the liquid should be accepted as the sole index of the putrescibility. Doctor Hale's procedure consists in adding one cc. of methylene green solution at the beginning and continuously thereafter as demanded by adsorption until a slight color persists in the liquid. Decolorization of this was taken as the endpoint. Doctor Hale considers that this method gives good relative results, but probably does not represent absolute values. My aim was to obtain correct relative stabilities, while Doctor Hale's procedure aimed at relative results. In this respect our problem differed. Notwithstanding, I decided to investigate whether the observation of the decolorization of the sediment actually furnishes correct relative stabilities, and if not, which procedure would have to be followed. Jackson and Horton† recommend the use of as little methylene blue as possible, on account of its antiseptic properties, and the writer‡ in investigating the quantities recommended in the "Standard Methods" fixed the amount at 0.4 cc. of a 0.05 per cent. aqueous solution per 150 cc. bottle capacity. When working with waters carrying colloids, it is clear, of course, that there should always be 0.4 cc. or less of the coloring matter in solution, provided the sediment containing the precipitated coloring matter is actually inert. An excess of coloring matter in solution would interfere with obtaining correct results. If the coloring matter in the sediment retains its antiseptic qualities, even though to a lesser degree, it would still be impossible to obtain correct figures. The entire question depends, of course, upon the value of all methylene blue or other similar "relative stabilities" when applied to liquids other than sprinkling filter effluents.

Since the decolorization of the blue color coincides fairly closely with the elimination of the total available oxygen, I first determined the oxygen

* Spitta and Weldert: Mitt. kgl. Prüfungsanst. Wasserversorgung, Heft 6, p. 160.
† Jackson and Horton, J. Ind. Eng. Chem., Vol. 1, June, 1909.
‡ Lederer, Am. Jour. Pub. Health, Vol. 4, p. 241.

at the time of decolorization of the liquid and sediment as well. An artificial turbidity of 100 was imparted to a putrescible sewage-water mixture and a number of glass stoppered bottles were filled with this liquid. A number of these bottles were colored in the proper proportion with methylene blue, the others remained as "blanks" for the determination of the residual available oxygen. The results are given in the following Table I.

TABLE I.

ELIMINATION OF AVAILABLE OXYGEN IN TURBID WATERS ON APPLYING THE METHYLENE BLUE PUTRESCIBILITY TEST.

Serial No.	Date and time 1914.	No. of cc. 0.05% methy. blue added per 150 cc. capacity.	Color of supernatant liquid in 24 hours.	Time of decolorization of liquid in hours.	Time of decolorization of sediment in hours.	P. P. M. total initial available oxygen.	P. P. M. residual oxygen at time of decol. of liquid.
1	Apr. 14 11.00 a. m.	0.4	colorless	24	Sediment did not decolorize in 10 days	23.3	10.5
		0.8	colorless	24		23.3	10.5
		1.2	colorless	24		23.3	—
		2.0	blue	blue after 10 days		23.3	—
2	Apr. 15 10.30 a. m.	0.4	colorless	24	Sediment did not decolorize in 10 days	23.5	8.8
		0.8	colorless	24		23.5	8.8
		1.2	colorless	24		23.5	8.8
		2.0	blue	blue after 10 days		23.5	—
3	Apr. 20 11.00 a. m.	0.4	colorless	20*	88	20.1	0.5
		0.8	colorless	20*	105	20.1	0.5
		1.2	colorless	20*	112	20.1	0.5
		2.0	slightly blue	45	119	20.1	0.4
4	Apr. 23 11.00 a. m.	0.4	colorless	24	Sediment did not decolorize in 10 days	22.1	4.7
		0.8	colorless	24		22.1	4.7
		1.2	slightly blue	48		22.1	0.6
		2.0		93		22.1	0.5
5	Apr. 27 11.00 a. m.	0.4	colorless	20*	52	18.7	0.5
		0.8	colorless	20*	61	18.7	0.5
		1.2	colorless	20*	70	18.7	0.5
		2.0	blue	45	76	18.7	0.4
6	Apr. 29 11.00 a. m.	0.4	colorless	20	100	21.0	2.9
		0.8	colorless	20	118	21.0	2.9
		1.2	colorless	20	127	21.0	2.9
		2.0	blue	45	142	21.0	0.7
7	Apr. 30 11.00 a. m.	0.4	colorless	20	127	21.4	5.0
		0.8		20	148	21.4	5.0
		1.2		20	169	21.4	5.0
		2.0		45	181	21.4	0.4

* Decolorized during the night, therefore estimated but roughly. The absence of the residual oxygen at the time of the decolorization of the liquid is of course due to the fact that the oxygen has not been determined at the exact time of decolorization.

These tabulated results indicate the following conclusions: A very serious mistake can be made by assuming that the decolorization of the sediment in silt-bearing waters is the correct measure of the "relative stability." Experiments 3, 4, 5, 6 and 7 show that the decolorization lags far behind the elimination of the available oxygen in such liquids or in other words the methylene blue, once adsorbed, is largely inert as an indicator. This bears out Doctor Hale's assumption. The adsorbed liquid is, however, not entirely inert, as otherwise the sediment would never decolorize. The fact that the sediment decolorizes only under prolonged ultra-anærobic conditions makes such an observation useless for quantitative purposes. Reliance on the decolorization of the liquid is equally doubtful because we cannot tell to what extent the decolorization is really adsorption. We can only be fairly certain of obtaining accurate "relative stabilities" if we knew that 0.4 cc. or less of the coloring matter per 150 cc. bottle capacity would remain in excess over the adsorption requirements, and that the adsorbed methylene blue was entirely inert. This cannot be insured under practical conditions, but remains a matter of chance. If more than 0.4 cc. of the coloring matter remains in solution, the antiseptic qualities of the dye would make itself felt and higher "relative stabilities" would result. The adsorption of the coloring matter seems to bear a definite relation to the amount of colloidal matter present, and indeed some German observers have recommended a quantitative procedure for determining colloids on this basis. The methylene blue test in waters carrying colloids is, therefore, of negative value only; *i. e.*, if the blue color of the liquid persists irrespective of adsorption, the "relative stability" is 100, or an excess of oxygen may be present.

A number of coagulants, such as freshly precipitated aluminum hydrate, magnesium hydrate, calcium carbonate and calcium oxide were employed to mechanically settle the colloids previous to introducing the coloring matter. The results were not sufficiently encouraging to follow this line of experiment. The addition of electrolytes to sewage, such as common salt did not accelerate the sedimentation sufficiently to be of practical advantage.

I am forced to conclude that it is useless to determine "relative stabilities" in turbid waters by the methylene blue method. This is unfortunate, since it robs us of a simple and convenient field procedure. To obtain the correct oxygen demand in such waters, the following procedure is requisite:

Determining the initial available oxygen. The free oxygen has to be determined on the spot. A sample for nitrate and nitrate determination can be preserved with chloroform and shipped to the laboratory. Three other samples should be collected carefully to avoid aëration. To one sample add either a certain quantity of fresh water (free of nitrites and nitrates) with a known oxygen content or a definite quantity of saltpeter.* Personally, I prefer to add saltpeter, since it is a

*Lederer, J. Infect. Dis., Vol. 14, p. 482.

much simpler procedure. The other two samples remain as originally collected. All of these samples are now incubated in closed bottles for ten days at 20° C. At the end of this incubation period, the residual available oxygen is determined in the samples devoid of saltpeter or additional water. The other sample is examined quantitatively for nitrites and nitrates. If free oxygen remains at the end of incubation the residual saltpeter oxygen need not be determined. All figures are referred to one liter of original river water. The nitrite nitrogen multiplied by 1.7 and the nitrate nitrogen multiplied by 2.9 express equivalents of oxygen. The initial available oxygen minus the residual oxygen expresses the biochemical oxygen demand. When the water is very badly polluted, the free oxygen sample need not be incubated for the reason that the free oxygen is certain to be absent after incubation. In connection with these incubations, it is important to keep in mind that the nitrites and nitrates are attacked while free oxygen is still present. As a rule, the nitrites and nitrates begin to be attacked when the free oxygen content is reduced by about 50 per cent.

MINUTES OF THE FORTY-SECOND MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

JACKSONVILLE, FLORIDA, NOVEMBER 30 TO DECEMBER 4, 1914.

First Session.

The Forty-Second Annual Meeting of the Association was called to order at the Seminole Hotel, November 30, 1914, at eight oclock p. m., by President William C. Woodward. Two hundred and seventy members were present.

The invocation was offered by the Rev. J. Lindsey Patton, of the Church of the Good Shepherd.

The address of welcome was given by the Honorable George M. Powell, Chairman of the Board of Bond Trustees, Jacksonville.

Responses were made as follows:

For the Dominion of Canada, Dr. Frederick Montizambert; for the United States, Dr. J. W. Trask; for the Republic of Cuba, Dr. Alfredo Dominguez.

The President stated that, owing to the present unsettled condition of Mexico, no representative had been able to attend. He read the following letter from Dr. Eduardo Liceaga, for many years president of the Federal Board of Health, Mexico:

"The present circumstances in my country will not permit me to assist in the annual meeting of the Association in Jacksonville but I ask you to consider me as an active member of the Society. My enthusiasm for the Association is the same as for the past thirty-three years, and I beg of you to tell this to all our old and excellent friends who are assisting in the meeting.

"I remain as ever,

"E. Liceaga"

The First Vice-President, Dr. J. F. Anderson, then took the Chair and introduced the President who delivered the presidential address, "A Plea For Efficiency and Economy in the Maintenance and Operation of Private Agencies Working for the Conservation and Promotion of Public Health."

On motion, the meeting adjourned.

Selskar M. Gunn,
Secretary.

Wm. C. Woodward,
President.

Second Session.

The meeting was called to order at 8 p. m., December 1, 1914, by the President. The minutes of the 1913 meeting having been published in the Journal of the Association, reading was by unanimous consent dispensed with.

Dr. Charles Hatfield presented a resolution with regard to holding a National Public Health Congress in 1916. Resolution was referred to the Executive Committee.

The following papers were read:

The Federal Meat Inspection Service, and Sanitation of Packing Houses under Its Supervision, by George H.

Shaw, Sanitary Engineer, U. S. Department of Agriculture, Bureau of Animal Industry.

Sickness Insurance and Its Relation to Public Health, by B. S. Warren, M. D., U. S. Public Health Service Sanitary Advisor, United State Commission on Industrial Relation, Washington, D. C.

Necessity of Coördinating the Volunteer Public Health Work, by Frederick R. Green, M. D., Secretary, Council on Health and Public Instruction, American Medical Association, Chicago, Ill.

Smallpox Epidemic at Niagara Falls, by Linsley R. Williams, M. D., Deputy Commissioner of Health, State Department of Health, New York.

Educational Work on Sanitary Food Values in New York City, by Donald B. Armstrong, M. D., Director, Department of Social Welfare, New York, Association for Improving the Condition of the Poor.

Registration of Communicable Diseases with Special Reference to Out-of-Town Cases, by F. M. Meader, M. D., Director, Division of Communicable Diseases, New York State Department of Health, Albany, New York.

Preventable Accidents Following Vaccination, by W. F. Elgin, M. D., Glenolden, Pa.

The following papers were read by title:

The Relationship of the Visiting Nurse to the Public Health Campaign, by Ella P. Crandall, Executive Secretary, The National Organization for Public Health Nursing, New York City.

Health and Economic Results of Rural Depopulation and Abnormal Increase of Cities, by Peter H. Bryce, M. D., Chief Medical Officer, Department of the Interior, Canada.

On motion the meeting then adjourned.

SELSKAR M. GUNN,
Secretary.
WM. C. WOODWARD,
President.

THIRD SESSION.

The meeting was called to order at 2 p. m., Dec. 2, with the President in the Chair. The President pointed out that this meeting was to be a joint session with the National Mouth Hygiene Association and introduced Dr. Harvey W. Wiley, the president of that organization, who thereupon took the Chair.

The following papers were then read:

The Place of Mouth Hygiene in the Personal and Public Health Movement, by William G. Ebersole, M. D., D. D. S., Cleveland, Secretary and Treasurer, National Mouth Hygiene Association.

The Dental Clinic as a Community Investment, by Edward F. Brown, Secretary of the Association for Improving the Condition of the Poor, New York, City.

Dr. W. A. Evans then took the Chair.

The following papers were then read:

Popular Education in Mouth Hygiene through Organized Publicity —through the Press, the Platform, the Motion Picture and the Exhibit, by Myron Jermain Jones, M. A., Cleveland, Executive Director, the National Mouth Hygiene Association.

Diet and Dentistry, or the New Gospel of Health According to the

Oral Hygienist, by Harvey W. Wiley, M. D., Washington, President, National Mouth Hygiene Association.

On motion the meeting adjourned.

SELSKAR M. GUNN,
Secretary,
WM. C. WOODWARD,
President.

FOURTH SESSION.

The meeting was called to order at 8 p. m., December 2, 1914, with the President in the Chair. The Secretary read the report of the Executive Committee, including the report of the Secretary and Editor, the Treasurer, and the Committee of Seven.

REPORT OF THE EXECUTIVE COMMITTEE.

The Executive Committee begs to transmit to the Association the following resolutions and recommends their adoption:

1. That the Association adopt a permanent badge for its members, and that the Executive Committee be authorized to appoint a committee to select the design for such a badge and to arrange for their manufacture.

2. That the report, of the Committee of Seven, containing the reports of the Treasurer, Secretary, and Editor, be approved and that their adoption by the association be recommended and that the Executive Committee thank Professor Gunn and Dr. Frankel for their services.

3. WHEREAS, the opinion has been expressed by the President and many members of the American Public Health Association to the effect that it is desirable that all approved national associations dealing with various aspects of public health be brought into closer coöperation; and whereas a National Public Health Congress in which all such associations can participate, should work toward the desired end: Be it resolved, that the American Public Health Association is in favor of holding a National Public Health Congress at some time in the year 1916; that it is desired that all approved national organizations dealing with public health problems participate in this Congress; that so far as possible the Congress shall consist of the holding of the regular annual meetings of such societies at the same time and place; that a temporary organization to arrange for the general meetings of the combined groups be effected; and that the Executive Committee be given authority to formulate a plan for such a Congress.

4. That the Constitution and By-laws be amended by striking out everything in the Constitution after Article 1, Sec. 1, and by striking out the entire body of the By-laws.

5. That the Executive Committee be authorized to appoint a special committee to draft a new Constitution and By-laws to replace so much of the Constitution and By-laws as it is proposed to strike out, the committee to present its report at the next Annual Meeting; that a copy of the proposed changes be sent to each member in good standing, at least, thirty days before the next Annual Meeting; and that each Section be urged to take such action as may be necessary for the adoption of desirable

changes in the Constitutions and By-laws of the Sections next year.

6. That the Committee of Seven be given authority to coöperate with the Central Committee on National Health Organizations, or other bodies engaged in public health work, should occasion arise before the next Annual Meeting of the Association.

SELSKAR M. GUNN,
Secretary.
WM. C. WOODWARD,
Chairman.

REPORT OF THE COMMITTEE OF SEVEN TO THE EXECUTIVE COMMITTEE.

The Committee of Seven has held four meetings since the Colorado Springs Meetings of the Association.

The Committee begs to state that since the Colorado Springs Meeting 351 new members of the Association have been elected as provided for in Chapter 5 of the By-Laws as amended December 6, 1911.

During the year the following motions have been passed by the Committee:

October 25, 1913.—"That the 1914 meetings of the American Public Health Association be held in the week commencing Monday, November 23, 1914."

"That the request of Professor Bartow for an appropriation to carry on the work of the Committee on Standard Methods of Water Analysis be refused, and that the Secretary notify Professor Bartow that the present funds of the Association prohibited the appropriation of money for this purpose."

"That the President be requested to appoint delegates to the National Conservation Congress, in compliance with the request of Mr. Thomas R. Shipp, the Secretary of that Congress."

"That the President be authorized to appoint a committee to study the Constitution and By-Laws of the Association with regard to their simplification."

"That the President be requested to communicate with the chairman of each section for the purpose of appointing a special committee to take up the question of what the Association can do to bring about an improved personnel of health boards and health officers, inspectors, etc."

December 27, 1913.—"It was moved and seconded that the resignation of Doctor Farrand as Treasurer of the Association be accepted with regret, to take place not later than January 31, 1914, or such date prior to that as he transfers the books and moneys of the Association to his successor."

"That the resignation of Doctor Farrand as editor of the JOURNAL be accepted with regret to take place not later than January 31, 1914."

"That Mr. Selskar M. Gunn be appointed editor of the JOURNAL and empowered to transfer the business of the JOURNAL and of the Association to Boston and that he make all such arrangements as may seem to him necessary and advisable for the further conduct of the JOURNAL and of the Association."

"That Doctor Lee K. Frankel of the Metropolitan Life Insurance Company be elected Treasurer of the American

Public Health Association, and that he commence the active duties as Treasurer as soon as the present Treasurer, Doctor Livingston Farrand, transfers to him the funds of the Association which is to be done on or before February 1, 1914."

"That a committee consisting of the chairman, Messrs. Folks and Gunn be authorized in the event of Doctor Frankel's refusal to accept the Treasurership to appoint some other person for this position."

"That the price of the JOURNAL be raised to $3.00 per year, and individual copies to 30 cents each, and that the change of price be put into effect at the convenience of the editor."

"That Doctor Lee K. Frankel, the Treasurer, be authorized to continue the present account of the Association, to open such new accounts as he may see fit and to transact all business as pertains to the office of Treasurer."

January 29, 1914.—"That it is the sense of the Committee of Seven that a properly supervised commercial exhibition can with advantage be held in connection with any scientific exhibition that the local committee may see fit to prepare."

May 25, 1914.—"That the dates of the Jacksonville meetings be changed from November 24 to 28 to November 30 to December 5."

"That the Committee of Seven felt that it had no power to authorize the formation of a new section of the Association as was desired by the Association for the Prevention of Pollution of River and Waterways, but that the Association would be very glad indeed to receive the members of this organization as members of the American Public Health Association and have them identify themselves with the Section that they are particularly interested in."

July 17, 1914.—"That Mr. Gunn be granted a vacation from August 25 until early in October with pay."

July 24, 1914.—"That the Treasurer be authorized by the Committee to transfer the accounts of the Association from the Lincoln Trust Company of New York to the Paul Revere Trust Company of Boston, and the Treasurer be also authorized to transfer the loan now being made by the Lincoln Trust on the Savings Bank Collateral to the Paul Revere Trust."

October 8, 1914.—"That in view of the authorization of the Committee on Trust Funds, the Committee of Seven of the American Public Health Association by virtue of the authority given them by the Constitution, hereby voted to authorize the Treasurer to pay up the loan of $2,500 due the Paul Revere Trust Company and that the balance of the Trust Funds left after paying the loan be transferred to the drawing account of the Association at the Paul Revere Trust Company of Boston."

November 16, 1914.—"That Mr. E. A. Moree of the State Charities Aid Society be appointed special Publicity Agent in connection with the Jacksonville Meetings and that his expenses, to and from New York to Jacksonville, be paid from the Association Funds."

The Committee reports that the

Treasurer's report appended herewith has been audited by Haskin & Sells, Public Accountants, and Harvey S. Chase, Public Accountant, and found correct.

November 30, 1914.

The committee begs to report that a sub-committee of audit has examined the cheques and accounts and the statements of the certified accountants, and begs to report that said cheques and vouchers, correspond to the reports of the accountants.

SELSKAR M. GUNN,
Secretary.
WM. C. WOODWARD,
Chairman.

On motion the report of the Executive Committee including its resolutions and the recommendations of the Secretary and Editor was adopted.

The following papers were then read:

A Campaign Against Quacks, by W. A. Evans, M. D., Chicago, Ill.

The Enforcement of the Tennessee Anti-Narcotics Law, by Lucius P. Brown, State Food and Drug Commissioner, Nashville, Tenn.

The Independent Spirit of the Dope User and What Are We Going To Do About It, by Donald McCaskey, M. D., Witmer, Pa.

The Curse of Narcotism in America, by Miss Jeannette Marks, South Hadley, Mass.

The following papers were then read by title:

The Present Status of Habit-Forming Drugs, by L. F. Kebler, Chief, Drug Division, Bureau of Chemistry, Washington, D. C.

The Genesis of the International Movement for the Mitigation of the Opium Evil, by Hamilton Wright, M. D., Cambridge, Mass.

After discussion, a resolution regarding the use of habit-forming drugs was presented by Dr. C. E. Terry.

Under the By-Laws, the resolution was referred to the Executive Committee.

The following paper was then read:

The Prevalence of Occupational Factors in Disease and Suggestions for their Elimination, by E. R. Hayhurst, M. D., Chief, Survey of Occupational Diseases, State Board of Health, Columbus, Ohio.

The following papers were then read by title:

The History and Development of Industrial Hygiene with Special Reference to the United States, by George M. Kober, M. D., Washington, D. C.

Health Insurance, by John B. Andrews, Ph. D., Secretary American Association of Labor Legislation, New York City.

On motion the meeting adjourned.

SELSKAR M. GUNN,
Secretary,
WM. C. WOODWARD,
President.

FIFTH SESSION.

The meeting was called to order at 9 a. m., December 3, 1914, by the President. The Secretary reported that the Executive Committee recommended the adoption of the resolution introduced by Dr. Terry, as follows, and it was adopted.

WHEREAS, The use of habit-forming drugs, such as opium, cocaine, chloral

and similar drugs, in this country is increasing with such rapidity as to have assumed the proportions of a national evil and—

WHEREAS, The effects of these drugs are admittedly prejudicial to health, community welfare, and race development, and—

WHEREAS, It is evident at the present time that there exists no widely efficient control of the evil—federal, state, municipal, or otherwise,

Therefore, be it resolved, That the President be empowered to appoint a standing committee of five members which shall be known as the Committee on Habit-Forming Drugs, and whose duties shall be as follows:

(1) The collection of all available accurate data relative to narcotism in the United States, in connection with which the Committee will endeavor to learn as far as may be practicable the attitude of the newspaper press with respect to advertisements of preparations of such drugs, coöperating in such inquiry with the American Newspaper Publishers Association in so far as may be deemed expedient.

(2) The preparation of a summary of existing legislation in this country.

(3) The preparation of a full report, to be presented at the next annual meeting of the Association, which shall have as its objects the presentation of existing facts; recommendations for the control of the present alarming situation as the Committee may deem advisable, and the outlining of such laws as shall control the importation, production, manufacture, sale, and distribution of habit-forming drugs.

The following papers were then read:

The Negro Health Problem in Southern Cities, by William F. Brunner, M. D., Savannah, Ga.

The Negro Health Problem in Rural Communities, by A. G. Fort, M. D., Augusta, Ga.

The Negro Health Problem, by L. C. Allen, M. D., Hoschton, Ga.

The Negro as a Problem in Public Medical Charity, by Lawrence Lee, M. D., Savannah, Ga.

The Influence of a Large Colored Population on the General Death-Rate, by Ernest C. Levy, M. D. Health Officer, Richmond, Va.

Syphilis Among Insane Negroes, by S. S. Hindman, M. D., Georgia State Sanitorium, Milledgeville, Ga.

Practical Remedial Measures for the betterment of the Hygienic Conditions of the Negro, by M. L. Graves, M. D., Galveston, Tex.

After discussion, the meeting was adjourned.

SELSKAR M. GUNN,
Secretary.

WM. C. WOODWARD,
President.

SIXTH SESSION.

The meeting was called to order at 9 a. m., December 4, 1914, by the President. The Secretary reported that the Executive Committee submitted the following resolutions to the Association recommending that they be adopted.

1. That the American Public Health Association desires to extend to Dr. Stephen Smith, one of the first organizers of the American Public Health Association in 1872, its congratulations on his continued enjoy-

ment of health, and its joy and pleasure in being able to illustrate the outcome of his efforts and those of his colleagues in the present prosperity of the Association, which has expanded till it represents the public health interests of four countries and of 125,000,000 people. The Association wishes Doctor Smith all the happiness which the contemplation of a life spent in public service for the amelioration of the sufferings of mankind may bring.

2. That the American Public Health Association desires to extend to Dr. E. Liceaga its regrets at the announcement of his withdrawal from the active duties as President of the Federal Bureau of Health of Mexico and to express its sense of the loss which the Association and the public health interests of Mexico and of the American continents will experience at the retirement of Doctor Liceaga from the oversight of the responsible work entailed upon Mexico through its geographical position. The Association wishes for Doctor Liceaga all the happiness and contentment which may come to him as he looks back over a long life spent in the public service of a people he has loved so well and for whom he has spent his life.

The following resolutions submitted to the Executive Committee by the Section on Vital Statistics were reported to the Association by the Executive Committee, with the recommendation that they be passed:

3. Whereas, The active coöperation of the Federal Bureau of the Census with state departments of health and registration offices has been an important factor in promoting the extension of the registration area for vital statistics, thus providing a broad basis of fact indispensable for constructive public health work,

Be it resolved, That the American Public Health Association hereby heartily approves of this coöperation in the past and directs its Executive Committee to do whatever it can to assure the continuance and promote its efficiency in the future, by appointing a special committee to work for the extension of the area within which all deaths and births are registered and for the increased utility of these returns to the cause of public health.

That hospitals having competent pathologists should take the necessary steps to obtain autopsies. That a copy of this resolution be sent to the Secretary of the American Hospital Association and the Secretary of the American Medical Association.

The Executive Committee reported that more than ten members of the Association had petitioned for the formation of a section on industrial hygiene, and recommended the formation of such a section under the name, Section on Individual Hygiene. The resolution was adopted.

The Secretary then presented the report of the Advisory Council.

Meeting of the Advisory Council.

The Advisory Council of The American Public Health Association was called to order by the Secretary at 5 p. m. at the Seminole Hotel, December 3, 1914. The Secretary read the roll call, and 48 members were present.

Dr. H. D. Holton was elected chairman, and Dr. A. W. Freeman secretary. The following members of the Association were nominated by ballot for the offices stated immediately preceding their respective names to serve for the terms provided by the Constitution;

President, Prof. W. T. Sedgwick, of Boston; *first vice-president*, Dr. C. J. Hastings, of Toronto; *second vice-president*, Dr. Juan Guiteras, of Havana; *third vice-president*, Dr. C. E. Terry, of Jacksonville; *Treasurer*, Dr. Lee K. Frankel, of New York; Members Executive Committee; Dr. John F. Anderson, of Washington; Dr. J. H. Landis, of Ohio; Dr. Alfredo Dominguez, of Havana.

Invitations for 1915 meeting were received from Albany, N. Y.; Baltimore, Md.; Buffalo, N. Y.; Chicago, Ill.; Charleston, S. C.; Cincinnati, Ohio; Columbus, Ohio; Denver, Col.; Galveston, Tex.; Indianapolis, Ind.; New York, N. Y.; Oakland, Cal.; Riverside, Cal.; Rochester, N. Y.; San Francisco, Cal.; Saratoga Springs, N. Y., St. Louis, Mo.; Springfield, Mass.; Toledo, Ohio; and Toronto, Ont.

On ballot it was voted that Rochester, N. Y., be recommended to the Association as the place of the 1915 meetings.

Dr. Edwardo Liceaga was recommended for Honorary Membership.

HENRY D. HOLTON,
Chairman.
ALLEN FREEMAN,
Secretary.

It was voted that the report of the Advisory Council be adopted.

The following resolutions by the Executive Committee, were reported to the Association with recommendation that they be adopted.

1. That a special committee of the American Public Health Association be appointed to prepare and submit at the next annual meeting a draft of the Standard Methods of the American Public Health Association for Plumbing and House Drainage.

2. That a special committee of the American Public Health Association be appointed to prepare and submit a report in full detail at the next annual meeting, giving specimen forms, for a complete system of uniform administrative accounting adapted to health department work.

The above resolutions were adopted.

In accordance with notice given at the Colorado Springs Meetings, the following change in the Constitution was presented:

That Section 7, Article 3, be amended by adding the words "or interested in" after the words "engaged in."

The change in the Constitution as presented was adopted.

Dr. Louis I. Dublin, Chairman of the Committee on Morbidity Statistics, presented the report of the committee. It was voted that the report be received and the Committee continued.

The report of the Committee on Cold Storage was presented. It was voted that the report of the Committee be recorded, but not at present adopted, and that the Committee be continued.

The following papers were then read:

Life Extension, by Professor Irving

Fisher, of Yale University, New Haven, Conn.

The Protection and Maintenance of the Public Health During and Subsequent to a Great Conflagration, by William C. Hanson, M. D., State Department of Health, Boston, Mass.

A Rural Sanitary Survey, and What It Reveals, by Oscar Dowling, M. D., President, Louisiana State Board of Health, New Orleans, La.

The following papers were read by title:

The Relation of the City to the Milk Supply, by Nathan Strauss, New York City.

A Proposed American Public Health Association Course of Study for Health Officials and Others Interested in Public Health Work, by F. D. Bell, New York City.

The Sanitation of Vera Cruz, Mexico, by James T. B. Bowles, New York City.

It was voted that the Association express its appreciation of the public-spirited and disinterested services rendered by Mr. E. A. Moree of New York in connection with the publicity work of the Jacksonville meetings.

SELSKAR M. GUNN,
Secretary.

WM. C. WOODWARD,
President.

CLOSING SESSION.

The meeting was called to order at 5.30 p. m., December 4, by the President. The Secretary then read reports from the Sections announcing the election of the officers, named as follows:

Laboratory Section.

Chairman, Prof. C.-E. A. Winslow,
Vice-Chairman, Prof. H. W. Conn,
Secretary, Dr. D. L. Harris,
Recorder, Dr. A. W. Freeman,

Vital Statistics Section.

Chairman, Dr. C. L. Wilbur,
Vice-Chairman, Dr. W. A. Plecker,
Secretary, Dr. Louis I. Dublin,

Section of Public Health Officials.

Chairman, Dr. J. H. Landis,
Vice-Chairman, Dr. W. S. Rankin,
Secretary, Dr. E. C. Levy,
Recorder, Dr. A. S. Fell,

Sanitary Engineering Section.

Chairman, Mr. Geo. W. Fuller,
Vice-Chairman, Prof. Geo. C. Whipple,
Secretary, Dr. H. D. Pease,

Sociological Section.

Chairman, Dr. H. E. Dearholt,
Vice-Chairman, Dr. Lee K. Frankel,
Secretary, Dr. W. F. Snow,

The following resolution was then adopted.

Resolved, That the American Public Health Association desires to express its appreciation of, and thanks for the splendid reception which has been extended to it as an official body and to its individual members and their friends by the city of Jacksonville, the City Council and by its Board of Health. It desires especially to compliment the City Health Officer, Doctor Terry, as chairman, and the members of the local committee of arrangements for the splendid facilities given the Association for prosecuting its work.

In the name of the ladies of the Association the members desire to extend their thanks to the ladies of Jacksonville for the constant attention and courtesies extended to the visiting ladies.

The Association further desires to express its appreciation of the able manner in which the press of Jacksonville and the public press of the country generally have given publicity to the proceedings of the Association.

Finally the Association cannot fail to recognize the existence of general interest on the part of the federal, state, provincial and municipal governments, in so generally sending their officials to coöperate in the work of the Association, so important to the health interests of the four countries forming the Association.

The following telegram was received from President-elect William T. Sedgwick:

"Surprised, gratified, and honored by your kind action. Can succeed only with support of all."

It was moved by Dr. P. H. Bryce and seconded by Dr. Oscar Dowling, the vote being put by Dr. Charles Hastings, that a vote of thanks be extended to the retiring president, Dr. William C. Woodward, for the manner in which he had conducted the meetings. This was adopted by a standing vote.

The Association then adjourned,

SELSKAR M. GUNN,
Secretary.

WM. C. WOODWARD,
President.

REPORT OF THE SECRETARY AND EDITOR TO THE COMMITTEE OF SEVEN AND THE COMMITTEE ON JOURNAL.

It has seemed to me advisable to make a formal report this year of the work done by me and my staff since the Colorado Springs Meeting. While it might be better to make two separate reports with respect to my two offices, it appears to me really necessary to present a combined report on account of the present close interrelation of my two positions and in order that you may obtain a general idea of the whole situation.

If agreeable to you and to the Executive Committee, I would respectfully suggest that this report be referred to the Association as a whole, as I believe that the members are to a considerable extent ignorant of the general problems and financial situation of the Association.

The Association.

Since the Colorado Springs Meetings we have taken in 351 new members. This is a record of 232 more than has ever been taken in between meetings and is an encouraging sign. The credit for this marked increase belongs to Mr. Frank H. Canaday, the business manager of the JOURNAL, and to the

coöperation of a number of our members. The prospects for even greater increases are good, as the publicity work which we have been doing for the past two years has made the Association known to many who were ignorant of its very existence. The growing increase of interest in public health and the constant recruiting of trained men and women to the public health field should help very materially in the future. More and more people who were interested only in one branch of the work, such as the prevention of infant mortality and tuberculosis, are recognizing that they must take cognizance of many aspects of public health in order to bring about their cherished hopes in their particular field. The total membership on November 21, was 1,350 in good standing.

Dr. Wm. C. Woodward, at the Havana meeting in 1911, presented a report as Secretary which emphasized some of the defects of the Association. Some of these have been rectified, but his main contention that the Association was of little significance between meeting times is still true. The question that I should like to put before you is this: Is the Association desirous of continuing as in the past by having an annual meeting and publishing a journal and doing nothing else, or does the Association want to take a more prominent place in the four countries and through its officers build up an organization that will be able to make itself felt every day in the year if need be? Do the members want the Association to become a great active health organization, assisting in the formation of affiliated state health association, helping to bring about desirable legislation in federal, state and municipal governments, advising and assisting communities and individuals engaged in public health work, aiding in correlating and coördinating much of the public health effort which is being attempted? I do not presume to answer these queries, but I believe that the time has come when the Association must face the question and the possible formation of another organization which will do these things, if the American Public Health Association does not want to undertake them. The Central Committee on National Health Organizations, composed of representatives from a number of national public health organizations, has recently been formed and is engaged at the present time in making a thorough study of existing national organizations which are engaged in some phase of public health work. Their report should be made before many months have elapsed. It is not possible to foretell their recommendations. If it should be deemed advisable to have an organization capable of carrying on the work outlined generally by me, are the members of this Association desirous that the American Public Health Association should be the organization to undertake it?

These thoughts are offered in no controversial spirit but with the earnest belief that here indeed is a matter of great import to the Association. I hope that this meeting will not disband without having given the matter proper

consideration and arrangements made for such steps as may seem desirable in the future.

If the Association should attempt any such program, an increased budget would have to be met, the executive staff would have to be reorganized and augmented. Your Secretary assures you that he is not endeavoring to create a new position for himself and would gladly relinquish his present position if the Association desired it.

The Journal.

With the departure of Doctor Farrand for the University of Colorado and his resignation as editor, you were kind enough to ask me to serve as editor and abolished the position of managing editor, which I had previously held. With this change it was deemed advisable to do away with the New York office and to transfer all of its activities, as far as the JOURNAL was concerned, to Boston. This was done early in the year, and Dr. P. P. Jacobs, who had so faithfully served as business manager, relinquished this position. Arrangements were made to have the second class entry of the JOURNAL transferred to the Boston office. The following gentlemen kindly consented to serve in the capacity of advisory editors: Dr. Charles V. Chapin, Dr. Livingston Farrand, Prof. George C. Whipple, Dr. Wm. C. Woodward, Dr. Peter H. Bryce. Dr. H. L. Mann was appointed as business manager, at a salary of $125.00 a month, and held this position until July, when Mr. Frank H. Canaday succeeded him at a salary of $75.00.

Circulation.

Constant efforts have been made to increase the circulation of the JOURNAL and although the progress has been slow, it has been positive. We had 1611 names on the paid circulation list for the November issue, an increase of 300 since January. Last year our paid circulation list was apparently larger, but this was due to two large gifts which enabled us to send the magazine to 1,400 people, as a gift. With the expiration of these donated subscriptions, efforts were made to keep the names on the lists by having the individuals take out subscriptions themselves. The results were not very satisfactory. Many efforts have been made to increase our subscriptions from health officers, and several letters, special printed circulars, etc., have been sent but with exceedingly poor results. I am of the opinion that until the health officers of the country receive adequate remuneration for their services they will not be willing to join the Association and subscribe to the magazine. Many have written in saying as much, and it would be a further waste of money and time to attempt to entreat them at the present time. It must be remembered, also, that health officers are able to get free of all cost a great deal of public health literature from the federal government services, state and municipal departments of health, etc. The amount of such available material is large and ever increasing. This fact is of considerable significance and makes it the more difficult to interest the poorly paid health official in a magazine which he will have to pay for.

Volume III (1913), had 1,384 pages, and it is certain that the present volume will be about the same. These figures are exclusive of the advertising pages.

In the fourteen issues published since the Colorado Springs Meeting, there have appeared 112 articles read at Colorado Springs, 27 original articles, 10 articles read before the Massachusetts Association of Boards of Health, making a total of 149 articles, or more than 10 to each issue. Furthermore, 10 committee reports have been published, 33 books reviewed and 52 health department reports abstracted. There have also appeared 21 editorials, 215 Public Health Notes, 212 Health Department Notes, 71 Industrial Hygiene and Sanitation Notes and 670 articles on various phases of public health have been noted in the section devoted to Current Public Health Literature. The amount of time given to the various note and review sections is considerable, but as far as I can learn these divisions are among the most popular and interesting in the magazine. It is hoped to develop these sections further and also to open up some new ones, such as a Question Box and sections devoted to communications and personal notes.

Advertising.

With a scant circulation, advertising comes hard. However, our growth in this direction has been constant and healthy. In the year ending August 31, 1914, we took in $1,886.48 from advertisers as against $931.34 for the previous year—an increase of $955.14. This was accomplished by raising the rates and by getting new advertisers. The war has caused us to lose temporarily some advertising but we expect it back eventually. We have a number of good prospects and the advertising situation is better than ever before, although far from what it might be.

A Serious Criticism.

One of the most serious criticisms that can justly be directed against the JOURNAL is the inevitable delay that must arise in publishing many of the papers read at the annual meeting. For example, some of the papers read at Colorado Springs Meeting appeared in the November, 1914, issue. No one realizes the injustice to the authors concerned more keenly than your editor and he feels that arrangements must be made to obviate this difficulty in the future. With five sections in addition to the meetings of the General Association it becomes an impossible financial burden to print all the papers read in the first few months after the annual meeting and then have funds to publish the magazine until the next meeting comes around. Furthermore, on account of the large number of manuscripts on hand after a meeting, your editor is unable to invite contributions to the magazine on subjects of current interest on account of the inability to pay for printing them. Also not a few manuscripts have had to be returned to authors with regrets for the same reason. It is encouraging to note that writers and investigators on public health

topics are coming more and more to recognize that the JOURNAL is the proper place for their contributions. Two years ago it was rare to receive any voluntary communications. Now every week manuscripts are received. In order to obviate this grave difficulty, which in my opinion is seriously retarding the development and advance of the JOURNAL, and with the idea of giving fairer treatment to authors of papers read at the annual meetings, I would respectfully suggest that the editor be given authority to notify authors whose papers cannot be printed within a reasonable time so that the author can have the opportunity of having his article printed in some other journal, without delay, and that a one-page abstract be prepared by the author, if he desires, and published in the JOURNAL as soon as possible after the meeting has taken place. If this were done it would mean a great deal to your editorial staff and would be a step in the direction of the self support which we are striving for.

Your editor feels the JOURNAL is capable of improvement in practically every direction, but believes that real progress has been made during the past year. Self support is not in immediate sight, but from a careful analysis of income and expenses it is apparent that the coming year, if conducted along lines similar to the past two years, should show a great improvement. I feel confident that in place of a deficit of between $4,000 and $5,000 which has had to be met during the past two years, that the coming year should only need less than $2,000 to be raised in addition to our regular income.

The Financial Situation.

It is difficult to separate the finances of the Association and the JOURNAL. The work of both is so thoroughly interwoven that separation becomes almost impossible. A different system of bookkeeping to the one used might be of assistance. It is obvious, of course, that the expenses of the Association are small compared with those of the JOURNAL. The financial statements appended are worthy close study. It must be remembered that 14½ months have elapsed since the Colorado Springs Meetings. A financial statement for the year ending August 31, 1914, is presented and also a supplementary statement for the period from September 1 to November 18. A condensed balance sheet for the whole period (14½ months) shows that the excess of Quick Assets over Immediate Liabilities is $32.76. This would indicate solvency, but of course there is an item of unearned paid subscriptions which would have to be rebated if publication ceased.

Donations.

For the year ending August 31, 1913, $2,000 was donated and this, with $2,500 borrowed on the Trust Funds of the Association, made it possible to keep the JOURNAL going. With the Trust Funds largely used up, it became necessary to raise money for the year ending August 31, 1914, by donations alone. Doctor Farrand, in the fall of 1913 wrote to the members asking for

assistance and in all $1,212 was received from many generous members, who gave in many instances sums which really meant personal sacrifice. However, when the business end of the JOURNAL was transferred to Boston in January, it was still necessary to raise more funds. Your editor asked for the assistance of Prof. W. T. Sedgwick, an honored member of the Association, who tackled an always unpleasant task, and received donations amounting to $2,850 from some generous Boston men, who gave really to Professor Sedgwick and not to the Association and the JOURNAL. A generous and ever helpful friend and member of the Association later gave $600, making a total of $4,662 donated during the year.

When the business end of the JOURNAL was transferred to Boston in January, $3,500 was owed the Rumford Printing Company for printing the July, August, September, October, November and December issues of 1913 and the last edition of the Standard Methods of Water Analysis.

This was a heavy load to undertake, but we have since been able to pay $2,400 on the 1913 accounts and besides have paid for printing all of the issues for 1914 except for November, the bill for this only having been recently rendered. I feel that this is a very good showing and it makes me feel very sanguine for the future. It has been demonstrated that it costs a great deal to get new members and new subscribers, but our salvation lies in these directions at the present time, and we have indications that our present methods are being successful. To build up a large subscription list is the work of time,—it cannot be done over night.

It is interesting to note that in the year ending August 31, 1913, we paid $2,501.85 to the printers and in the year ending August 31, 1914, $4,556.35. This last amount included a number of 1913 bills and this explains the apparent increase. The actual cost of printing the 1914 volume will probably be less than was paid for printing 1913.

It is interesting to note that even taking into consideration the fact that in 1914 we have paid these 1913 bills, and have had the extra expenses of moving the office from New York to Boston, the actual disbursements for 1914 are $15.54 less than for 1913—$13,032.39, as against $13,047.93.

General Conclusions.

These facts are presented to you to show that the present financial situation while still presenting many difficulties, is on the whole better than it was in August 1913. Our incomes last year *exclusive of gifts* averaged $816 a month. According to our present budget our expenses per month for 1915 should not exceed $950. Assuming that our income from regular sources will not decrease, and there is no reason to imagine that it should, we have a deficit of only $1,600 for 1915 as against one of $4,000 to $5,000 for the previous two years.

It certainly will be necessary to raise some money unless our membership and subscription lists should increase sufficiently in the interim to wipe out the threatened deficit.

Many members have given us their earnest coöperation in our efforts to increase both memberships and subscriptions. There is no better way to help than in this manner. If *every* member would get only *one* new member and subscriber at $5, our difficulties would disappear at once and we should become self-supporting, and with the additions we would be in a much better position to get advertising and to increase our advertising rates.

To the generous donors of funds, to the members who have given no less generously of their time and thought, I extend grateful thanks. If the many who as yet have not taken any special means to assist could only become infected with the enthusiasm of the few and go and do likewise, present financial problems would be quickly dissipated, and our time and attention could be given more constantly to the aims of improving the Association by making it more useful to you and to the countries represented in it, and by developing a Public Health Journal nearer our ideals and aspirations. Who will aid in making these hopes and ideals real?

In earnest and for service,

Respectfully,

SELSKAR M. GUNN,

Editor and Secretary.

REPORT OF THE TREASURER AMERICAN PUBLIC HEALTH ASSOCIATION.

SEPTEMBER 1, 1914.

August 31, 1913, Balance in Lincoln Trust Co.		$462.55
RECEIPTS.		
Association Dues	$2,579.25	
Advertising	1,886.48	
Donations	4,662.00	
Refunds and Allowances	7.91	
Interest Receivable	28.52	
Subscriptions to JOURNAL Sales of JOURNAL Sales of Water Reports Sales of Transactions Sales of Milk and Air Pamphlet Misc. Receipts	5,291.87	
		14,456.03
		$14,918.58
DISBURSEMENTS.		
For JOURNAL:		
Printing JOURNAL	$4,556.35	
Mailing JOURNAL	274.35	
Cuts for JOURNAL	1.09	$4,831.79

For Association:			
Colorado Springs Expenses		$558.95	
For JOURNAL and Association:			
Salaries	$2,575.00		
Pay Roll	1,339.97		
Stationery and Supplies	166.40		
Postage	557.02		
Trans. on Sales	32.61		
General Expenses	501.15		
Interest and Discount	175.06		
Re-sales	24.19		
Rent	323.35		
Boston Office Expenses	587.78		
Refunds	13.97		
Storage	105.90		
Misc. Printing	933.35		
Office Fixtures	131.90		
Transfer from Gen. Acct. to Drawing Acct.	100.00		
Traveling Expenses	74.00		
Shorts and Overs	.01	7,641.66	$13,032.40
August 31, 1914, Balance			$1,886.18

SUPPLEMENTARY REPORT OF THE TREASURER AMERICAN PUBLIC HEALTH ASSOCIATION.

SEPTEMBER 1, 1914 TO NOVEMBER 18, 1914.

September 1, 1914, Balance in Paul Revere Trust Co.			$1,886.19
RECEIPTS.			
Association Dues		$646.00	
Advertising		391.14	
Donations		85.00	
Refunds		2.99	
Interest Receivable		2.36	
Subscriptions to JOURNAL			
Sales of JOURNAL			
Sales of Water Reports		1,022.76	
Sales of Transactions			
Sales of Milk and Air Pamphlet			
Misc. Receipts			2,150.25
			$4,036.44
DISBURSEMENTS.			
For JOURNAL:			
Printing JOURNAL	$1,755.59		
Mailing JOURNAL	50.00		
Advertising for JOURNAL	20.00	$1,825.59	

For JOURNAL and Association:			
Salaries	$600.00		
Pay Roll	398.50		
Stationery and Supplies	134.53		
Postage	201.05		
Office Expenses	70.63		
Interest	2.92		
Rent	127.91		
Refunds	3.25		
Misc. Printing	122.23		
Office Fixtures	50.00		
Traveling Expenses	25.00	$1,736.02	$3,561.61
November 18, 1914, Balance			8474.83

BALANCE SHEET AMERICAN PUBLIC HEALTH ASSOCIATION.

CONDENSED TO SHOW QUICK ASSETS AND IMMEDIATE LIABILITIES.

As of Date November 18, 1914.

ASSETS.

Cash:		
Conn. Savings Bank	$1,829.15	
Nat. Savings Bank, New Haven	1,243.30	
Paul Revere Trust, Assoc. Account	474.82	
Paul Revere Trust, Office Account	35.04	
Cash in Office	8.90	
		$3,591.21
Accounts Receivable:		
Due from Sales and Subscriptions	249.00	
Due from Earned Advertising	320.84	
Due from Association Dues	279.00	
		848.84
Total Assets		$4,440.05

LIABILITIES.

Bills Payable:		
Paul Revere Trust Co., Loan		$2,500.00
Accounts Payable:		
Due Creditors on open account,		
Miscellaneous Office Expenses	852.98	
Rumford Printing Co.	1,854.31	1,907.29
Excess of Quick Assets over Immediate Liabilities		32.76
		$4,440.05

THE SIGNIFICANCE OF TYPHOID CARRIERS IN COMMUNITY LIFE, WITH A PRACTICAL METHOD OF DETECTING THEM.

O. McDaniel, M. D., and E. M. Wade, M. A.,
Division of Preventable Diseases, Minnesota State Board of Health.

Read before the Section of Public Health Officials, American Public Health Association, Jacksonville, Fla., December, 1914.

THE value of the Widal reaction in determining typhoid carriers has received very little place in this country in routine investigations or in literature. In 1911 Bigelow[1] reported its value in tracing the source of an epidemic of 213 cases. This was a man working in a dairy. He had had typhoid fever twenty-six years previously, and no symptoms since until, two weeks before typhoid fever broke out on the route, he had had a slight attack of diarrhea. B. typhosus was isolated from the urine. In 1912 Bigelow[2] reported a second successful attempt at isolating the source of infection of fourteen cases.

The first confirmation of these results was made by one of the writers in 1912 when request was made for the examination of the stools and urine of sixty members of a boat crew among whom several cases of typhoid fever had occurred within a month's time. From the fact that this freighter had been at sea for about a month and that there had been practically no chance of infection from without, it seemed that a carrier must be directly responsible.

The medical inspector was asked to submit to the laboratory blood specimens for the Widal test instead of specimens of stools and urine and if a carrier could not be found by this means the examination of the excreta would be undertaken. It was stated, however, that owing to the large amount of work entailed and the small laboratory force, only fifteen or twenty specimens could be attempted at a time. Also it was stated that under the best conditions much time must elapse in attempting isolation tests and that negative results were of little or no significance. The medical inspector realized that it would be difficult to detain the crew for the time necessary for this work and agreed to submit blood specimens. By evening of the day the specimens were taken, a report was returned and the cause of the infection located. Later B. typhosus was isolated from the feces of this man. This man was not employed in the handling of food but it was decided that an open water tank was responsible for the spread of the infection.

During the current year, 1914, this method has been used in the epidemiological investigations of typhoid fever by the Division of Preventable Diseases of the Minnesota State Board of Health and five very interesting cases are here reported. These epidemiological investigations have been made

under the direction of Dr. A. J. Chesley, Director of the Division.

1. Four cases of typhoid fever having occurred on a farm within five years, a search for the source of infection was commenced. The first of these cases occurred in L. D. H. in September, 1909, three months after his marriage. He had had typhoid fever forty-five years previously. This was followed by a case in August, 1910, in a nephew of L. D. H. which ended fatally. In July, 1913, a farm hand employed on this farm since July, 1911, developed typhoid fever and the fourth case occurred in December, 1913, in another farm hand who had been on the farm only since November.

Mrs. L. D. H. gave a history of typhoid fever in September, 1898, while a nurse. Recovery was slow and since that time she had had rheumatism, chronic appendicitis and "liver trouble." There was no history of gall stones.

Sanitary investigation of the premises by Dr. H. G. Lampson showed conditions to be above suspicion. Blood specimens for the Widal reaction were taken from residents of the farmhouse and the blood of Mrs. L. D. H. only showed the reaction to be present (1:50). Because of the presence of this reaction, specimens of her feces and urine were submitted to the laboratory for examination and B. typhosus was isolated from the feces. The fact that Mrs. L. D. H. was a trained nurse and used more care than might ordinarily be expected, undoubtedly accounts for the fact that there were not more cases traced to her.

2. Fifteen cases of typhoid fever occurring in the family and among its associates caused an investigation to be undertaken. The first case, Mrs. E., occurred in October 1909, since which time she has been disturbed mentally. The two daughters of Mrs. E. and the nurse in attendance developed typhoid fever in October and November of the same year, as also did a relative of Mrs. E. who lived across the road.

In the fall of 1911, four cases occurred in the family of the relatives across the road. In 1912 four more cases developed in the immediate vicinity, two of whom, however, denied contact with the family of Mrs. E. In 1913, one case occurred in the family across the road and in 1914 two more cases were traced to this same source.

Sanitary investigation by Dr. W. P. Greene showed some flies to be present and the privy about four rods from the kitchen to be unscreened. Otherwise conditions were good.

Blood specimens for the Widal reaction were taken from the members of the two families. The blood of Mrs. E. only showed the reaction present (1:50). Therefore specimens of feces and urine were obtained from her and sent to the laboratory. B. typhosus was isolated from the feces.

3. The appearance of typhoid fever in a case, G. S., not exposed to any known infection caused the investigation in September, 1914.

Investigation by Dr. W. P. Greene showed all probable sources of infection except the milk to be above suspicion. Milk was obtained from the

farm of L. B. where no typhoid fever existed. L. B. and Mrs. L. B. had both had typhoid fever twenty-eight years previously. Only two cows were kept by L. B. and so but few people used milk from this source. Milking was done by Mrs. L. B.

Blood specimens for the Widal test were taken from all residents at the farm. The only specimen showing the reaction present (1:50) was that from Mrs. L. B. and from her, specimens of feces and urine were sent to the laboratory. B. typhosus was isolated from the feces.

Upon determination of Mrs. L. B. being a carrier, information was obtained from a physician who had been resident of the town and a near neighbor for the last seventeen years. He himself used milk from this farm and developed typhoid fever in 1907. He states in a personal communication: "I do not recollect or have any means of ascertaining the milk supply of all the cases I have attended, and naturally less information about those attended by other physicians. However, I have a partial list of the typhoid cases supplied from this dairy, numbering sixteen to date, half of which I have attended professionally. Twice, at least, they have come in waves, those occurring eight years ago and this year. Some cases were light, some ordinary and some fatal."

4. Three known and other suspected cases of typhoid fever occurring during the present year in the family and employees of B. J. B., who operated a home bakery, caused the investigation. The first case occurred in January in a clerk employed in the bakery and the second case in July in another clerk. The latter acknowledged taking meals at the bakery. In October another employee developed typhoid fever.

Upon investigation by Dr. W. P. Greene, it was learned that Mrs. B. J. B. had had typhoid fever in 1908, Mr. B. J. B. in 1909, a niece in 1911 while visiting the family and the parents of Mrs. B. J. B. had both had typhoid fever forty-seven years previously.

Blood specimens for the Widal reaction were taken from all members of the family and the employees. The only one showing the presence of the reaction (1:50) was Mrs. B. J. B. Specimens of the discharges have been examined twice but so far isolation of B. typhosus has not been accomplished. Repeated examinations will be made.

5. Ten cases having occurred on a farm owned by W. W. S., investigation of the premises was made.

The first case developing on this farm was a contact case infected by a patient who was taken there to be cared for after having been infected in a railroad camp. This was in 1882 and no more cases occurred for twenty-four years. In 1906 an employee returned to the farm sick with typhoid fever after having been infected while working with a threshing crew. W. W. S. developed typhoid fever from contact with this case. In 1911, a daughter and the wife of W. W. S. developed typhoid fever. In 1914, four cases occurred—a maid, a hired man, a son, and finally the three-year-old daughter of an employee.

Investigation of the premises by Dr. H. A. Burns showed conditions

to be above suspicion and the source of the infection seemed to be one or more carriers.

Blood specimens for the Widal reaction were taken from all the residents and only the specimens from W. W. S. and Mrs. W. W. S. showed the reaction present (1:50). Feces and urine from both these individuals were examined and from the feces of each B. typhosus was isolated.

The next use to which this test was put was to locate and determine the number of typhoid carriers in two large state institutions, A. and B, in which typhoid fever was endemic. The examinations served a double purpose in that they were made just prior to the immunizing of the residents against typhoid fever by the administration of vaccine. Studies of the blood of the inmates following vaccination are given elsewhere.[3]

Institution A was a state hospital for the insane with a resident population of about two thousand. In this institution, typhoid fever had been endemic for many years. The water supply was above suspicion and was the same as the city water. The milk was all supplied from their own cows and general sanitary conditions were of the best. In January, 1913, the month preceding this investigation, seven cases of typhoid fever occurred in the institution, with three deaths. In February, the first blood specimens were taken and following these vaccination commenced. During the eight months the immunizing was in progress, eight cases occurred. During the next six months, when the majority of the inmates were immunized, but two cases occurred, but as the unvaccinated increased in numbers by new admissions, the number of cases of typhoid fever began to increase and three or four cases followed one another in close sequence. In all, within the eighteen months following the beginning of immunization, sixteen cases occurred with a mortality of four, or 25 per cent. All cases were among the unvaccinated and at the end of this time, July, 1914, the immunization of all having entered the institution since the previous immunization was undertaken.

One case deserves special mention—a patient, E. R., female, 22, unvaccinated, was in the tuberculosis ward but had become an arrested case and was transferred to another ward in which all the other inmates had been immunized. Living conditions were identical but she and she alone developed typhoid fever. Other similar instances occurred. To avoid typhoid fever it would seem advisable to administer typhoid vaccine to patients on entering the institution.

In September, 1914, one case which showed a positive Widal reaction following vaccination in 1913, developed symptoms of typhoid fever. Laboratory examination of feces and urine from this patient failed to demonstrate the presence of B. typhosus but B. paratyphosus was found to be present. In October another case developed symptoms of typhoid fever. The diagnosis was confirmed by the finding of B. typhosus in the stools. The blood of this patient did not show the presence of agglutinins following vaccination and there had been some

doubt in the minds of the hospital authorities of the successful vaccination of this patient.*

The blood specimens from 1,928 persons gave the following results: 37 showed the reaction present; 17 showed the reaction atypical and in the rest the reaction was absent. Owing to unavoidable circumstances there was delay in attempting isolation of typhoid bacilli from these cases but this was commenced a short time ago and so far we have been able to isolate B. typhosus or B. paratyphosus from five cases giving a positive Widal reaction and from one case showing a partial reaction. These examinations are being continued.

The hospital records of these patients were searched thoroughly for history of typhoid fever. This was a difficult matter as few physicians interested in the mental condition think of taking notes on the medical condition and especially on the history of infectious diseases. Of the 37 cases showing a Widal reaction before inoculation, 7 gave definite history of typhoid, B. paratyphosus having since been isolated from the stool of one of these, 3 gastro-intestinal symptoms, B. paratyphosus having since been isolated from the feces of one, 4 continued fever over extended periods of time, B. typhosus having since been isolated from the feces of one of these, and 23 gave no history but from the feces of two B. paratyphosus has been isolated. Of the 17 showing a partial Widal reaction, 4 gave definite history of typhoid, 3 gastro-intestinal symptoms, 2 continued fever and 8 gave no history but from the feces of one B. typhosus has been isolated.

TABLE I.

SHOWING HISTORY OBTAINABLE FROM 54 POSSIBLE CARRIERS.

Widal reaction.	History of typhoid.	Gastro-intestinal symptoms.	Continued fever.	No history obtainable.
Positive 37	7†	3†	4‡	23§
Atypical 17	4	3	2	8‡
54	11	6	6	31

We desire to point out that the histories in these cases are not complete, and undoubtedly if more complete records were obtainable a larger number of histories of previous typhoid infection would be acknowledged. It is believed by the writers that when the examinations of these cases are completed it will be definitely proven that a large number are typhoid carriers and therefore largely responsible for the endemic typhoid in the institution.

Institution B, a school for feeble-minded and epileptics, has a resident population of about seventeen hundred. In this institution typhoid fever had undoubtedly been endemic for years but not recognized as such as the

* This case was one of a group of 205 persons vaccinated by one man of which 90 failed to show agglutinine in the blood following vaccination. See also paper by Dr. C. C. Burlingame.[4]

† *B. paratyphosus* isolated from the feces in 1 case.

‡ *B. typhosus* isolated from the feces in 1 case.

§ *B. paratyphosus* isolated from the feces in 2 cases.

authorities claimed no typhoid fever for at least twelve years. In the first few months of 1914, many cases of typhoid fever appeared. The authorities, believing they had had no typhoid fever previously, looked for the cause of this outbreak among the new kitchen employees but they were not able to locate the source there. After some delay they finally agreed to vaccinate all inmates of the institution and this was taken advantage of to try to locate their carriers by the Widal test.

In all, specimens of blood were obtained from 1,548 persons and of these, 20 showed the Widal reaction to be present, from each of which specimens of feces and urine were submitted to the laboratory. To date, 7 of these 20 persons have been proven to be carriers, B. typhosus having been isolated from the feces of six and B. paratyphosus from that of one. Further examinations of the discharges of the remaining 13 persons are now being made. Because of the mental condition of these patients and the incompleteness of the hospital records, no history was obtainable in these cases.

The agglutinating property of the blood serum in various infections which was discovered in the course of studies in immunity by numerous workers was adapted to the practical diagnosis of typhoid infection by Grünbaum and by Widal and since Widal's communication in 1896 has proven to be of invaluable assistance in diagnosis. The extreme accuracy of this diagnostic method was early attested to by many and its use very rapidly became general. Today, after eighteen years, the Widal reaction appears to have greater value as an aid in diagnosis than even the most sanguine at first believed it to possess. Some of the early errors have been corrected by improved technique, especially by the use of the dried blood modification, by the changing to a higher dilution of the blood, and by very great care in regard to the culture used, and the more general use of the microscopic method as preferred by Widal. Some of the early errors were errors of interpretation only. Many of these were soon pointed out through the study of numerous cases of cholecystitis, cystitis and osteomyelitis, some of which had not been preceded by an attack of typhoid fever but in which the Widal reaction was present and B. typhosus was isolated from the bile, urine or abscess.

Apropos of such cases, Professor Welch[5] in 1897 pointed to the accuracy of a positive Widal reaction when he said "Infection with the typhoid bacillus cannot be positively excluded either on clinical grounds alone or by anatomic examinations at the post-mortem table."

After reporting the results of the examinations of 1,845 blood specimens taken from 1,100 persons, Wesbrook and Wilson[6] in 1897 referred to both the accuracy and the public health value of a positive reaction as follows: "There seems to be a wider field of usefulness for this method in the protection of public health from the contaminating sources made apparent by its use, which is almost, if not quite, equal to that afforded by the cultural diagnosis of diphtheria." These

writers probably did not have chronic carriers in mind but they suggested that persons in whom a positive reaction is present be placed under official surveillance until negative bacteriological examination of the discharges are made.

As early as 1899, after reporting a case of chronic cystitis continuing five years after typhoid fever and from which B. typhosus was obtained in purity from the urine, M. W. Richardson[7] called attention to the danger from such bacillus carriers and suggested the necessity of supervising these cases for years.

The actual tracings of cases to carriers following the lead of v. Drigalski and Conradi in 1902 and the suggestions of Koch and Frosch in 1903 have been reviewed so frequently that they are familiar to all. A review of the literature of carriers together with a discussion of the numerous problems concerning them was made in 1910 by Sacquépée[8] who also gave a comprehensive classification of typhoid carriers. More recently Müller[9] in 1913 has taken up the subject of typhoid bacillus carriers in insane asylums, and discussed in detail the problems involved. The main points of value in the exceedingly important and painstaking work of the many workers especially those of southwestern Germany have been repeatedly brought to mind and will not be detailed here. The constantly increasing long list of observers headed by Dönitz,[10] Lentz,[11] Forster,[12] for the most part agree that the Widal reaction is present in the blood of bacillus carriers with but few exceptions. Several of these observers call attention to the value of the Widal reaction as a preliminary test in the epidemiological search for carriers. Lentz in 1905 found the reaction present in ten out of eleven carriers and considered it of value especially when found in high dilutions. Friedel,[13] 1906, confirmed the constancy of the Widal reaction in carriers and considered it of value in detecting them. Bötticher[14] in 1906 found the Widal reaction almost universally present in bacillus carriers, but finding a fluctuation in the agglutinating power within wide limits he considered it advisable to begin with a titre of 1:10. Ledingham[15] in 1907 stated that the Widal test is a distinct aid in finding carriers but added that several would have been missed if searched for by the Widal test alone. Davies and Hall[16] in the same year also mentioned the importance of the Widal reaction in the determination of carriers. Müller[9] reported in 1913 that upon the advice of Hilgermann he had used with satisfactory results the Widal reaction in searching for carriers in an insane asylum. He recommended that in insane asylums all employees as well as patients be investigated for carriers upon entrance to the institution, advising that at least three negative bacteriological investigations of stools and urine be made in all persons whose blood agglutinated either B. typhosus or B. paratyphosus. Further that carriers should be excluded from the kitchen work and that "carrier patients" should be segregated, and suggested that "carrier nurses" might be put to good service in caring for such patients.

In the asylum at St. Thomas, Müller was unable, up to the time of reporting, to show that all who gave the agglutination reaction were bacillus carriers. It is interesting to note, however, that when after five negative bacteriological investigations of the discharges in one case and three in another he found both bacillus carriers, Müller concludes that they must have been carriers much earlier since they had respectively given a positive agglutination reaction ten and eight months previously. Scott[17] in the same year mentioned the value of the Widal reaction in healthy persons considering some to be carriers. Others he considered to be non-carriers, but no statement was made as to the number of bacteriological examinations of the feces and urine. He, however, recommended the Widal test as a routine procedure in all applicants for employment in the kitchens of institutions, and put such practice into effect at the General Penitentiary, Kingston, Jamaica. Not the least important point demonstrated by the southwestern Germany investigators is the fact that the bacteriological examination of feces and urine are not to be depended upon when negative results are found, a fact that has been confirmed by all observers upon this point. Not only are typhoid bacilli not found for considerable periods of time in the discharges of typhoid carriers who later show the discharges to contain typhoid bacilli, but there may be many failures to find typhoid bacilli even in the course of typhoid fever itself. The intermittency of the discharge of the bacilli, the difficulties of isolating when the organisms are few in number, the lack of satisfactory methods of transportation of specimens, and the possibility of substitution of specimens all are factors in making negative findings unreliable.

Because of the almost constant finding of the Widal reaction in the blood of bacillus carriers and because of the experience of others as well as of ourselves, it is desired again to call attention to the value of the Widal reaction as a preliminary test in attempting to locate carriers. In institutions and in outbreaks of typhoid fever under all conditions where the epidemiological evidence points to one or more carriers, the desirability of locating them is apparent. The determining and excluding of carriers from among institutional kitchen employees as practised by Scott should be widely adopted. Why stop here? Why wait for case after case to arise in boarding houses? Why wait for an outbreak of 213 cases in one dealer's milk route? While health board executives may have some of their troubles increased in the finding of bacillus carriers especially in civil life, it is impossible to agree with Overlander[18] that it is impractical to search for them at least in certain places. When one considers the large number of cases that have been traced to one carrier especially, through the handling of food even in one short exposure, surely the larger good of the many overshadows the hardship wrought upon the individual.

A positive Widal reaction in unvaccinated persons so certainly indi-

cates infection with typhoid bacilli that it is suggested that it might properly be used as an indicator for the exclusion of persons from work concerned in the handling of food or milk where the public health is concerned, *e. g.*, in dairies, creameries and milk depots including milkers and distributors, in bakeries, hotels, restaurants, and boarding houses, and in all schools, hospitals and penal and other institutions.

Health departments might place this test on their official score cards for dairies, creameries, etc., and thereby soon educate the public to demand that typhoid carriers be excluded from these occupations. Employment agencies would soon coöperate.

If it is true that one fifth of the chronic carriers (Conradi[19]) would escape detection by this application of the test, the number occupied in the handling of public food and milk supplies who would thus escape detection would be reduced to a minimum. It is understood that whenever the epidemiological evidence points toward one or more persons as possible carriers and the Widal reaction is absent (1:50 and 1:25), repeated examinations of the excreta should be made.

The exactness of positive bacteriological findings is incomparable in its desirability but if it is possible for one to fail to find typhoid bacilli in the discharges of a carrier on 75 consecutive days and then get a positive result, as reported by Semple and Greig, it is apparent that even repeated negative findings do not protect the public.

Most of the observations on the persistence of the Widal reaction have been made without corresponding observations on the persistence of the bacilli, but that it disappears following illness in a majority of cases in from a few months to one year is a common finding.

In a recent series of 44 cases of typhoid fever in which the reaction was present, later examinations made between the 90th and 120th day following onset showed 19 negative, 17 positive and 8 partial reactions. The persistency of this reaction for a longer or shorter period after the final disappearance of the typhoid bacilli adds safety to the test.

The occurrence of a positive reaction in certain tuberculosis cases as has been reported from time to time would not lessen the value of this test in its practical application to protect the public since tuberculous persons should be excluded from all work concerned in the handling of food. It would be interesting to know how many of these tuberculosis cases might be shown to be carriers of typhoid bacilli if daily bacteriological examinations of the discharges over a number of months were made.

The exceptional finding of a positive reaction in a person infected with paratyphoid or dysentery bacilli again only adds safety to this test. Here, too, persistent bacteriological examinations might show B. typhosus also to be present.

To be sure this test lacks in not affording positive proof that a person harbors typhoid bacilli and therefore would be dangerous to the public through the handling of food. In this respect, however, it is comparable to the

colon test which has long been used as an indicator of a dangerous water supply.

With our public water supplies safeguarded greater attention should be given to the protection of the public food supply as pointed out by Conradi and others and as evidenced by such outbreaks as that due to the Folkestone milker and the two recent outbreaks due to food pollution in this country.

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Discussion.

Dr. Bristol, *North Dakota:* In the neighboring state to Minnesota where Miss Wade has done her excellent work, that is in the state of North Dakota, the director of the state laboratory is also professor of bacteriology and hygiene, and at the same time is chairman of what we call our Students' Health Committee. Believing that the State University is responsible in a very large measure for the health of the students, we are about to recommend that this test be adopted, and that all those who apply for positions in the college commons shall submit to this test. We have somewhere near a thousand students, and a large majority of these students eat in the college commons and we are about to recommend that all who handle food in any way in the college commons shall submit to this test to determine whether or not they are carriers, at least whether their serum will agglutinate, and if so, to make further examination to determine whether or not they are carriers. I believe that quite a severe epidemic has occurred at Lehigh University, Pa., and this was charged to a servant in the kitchen of the college commons. I believe that will be of great practical value as eliminating these epidemics from such institutions.

Dr. P. S. Schenck, *Norfolk, Va.:* I want to relate two instances, one of which demonstrates how exceedingly difficult it is to locate a carrier and since I believe all public health workers are of the opinion that a vast majority of all our cases of communicable diseases are unquestionably due to carriers, we can account for them in no other way. This case in particular occurred on a Dutch ship which left West Hartlepool and came straight across the Atlantic Ocean to Norfolk. On the 5th of October it arrived, without having touched at any other point between those two points, and being a tramp ship, it was 26 or 27 days out. A day or two after her arrival, typhoid fever developed on board and in about ten days there were 16 cases of typhoid taken from the ship to St. Vincent's Hospital, leaving only 10 aboard out of a total crew of 26. Our services were called in at the request of the state quarantine officer who has no facility for making bacteriological or any other kind of examination, and we set to work to investigate the cause of this epidemic of typhoid fever on this ship. We have in our laboratory Doctor Andrews, who is acknowledged to be thoroughly conversant with his work. He, in conjunction with the state quarantine officer, searched that ship from top to bottom, and made a Widal of every man aboard and we then called in Doctor Newton, of the staff of Johns Hopkins, who has a bacteriological and pathological laboratory, but in spite of everything we could do we were unable to locate the cause of that epidemic.

The next case was one that has given me such great concern that I was almost afraid to leave Norfolk to come to this meeting. Up to the

time I left, which was on the 28th, we had had 9 cases of typhoid fever in the city of Norfolk and all 9 of them took their milk from one man. Now you gentlemen will probably say at once, "Well, that was easy." Well, it was not easy. This man drew his supply—he is a wholesale milk distributor and was formerly in the dairy business himself—he takes the entire output of 1,250 cows from 11 dairies. That typhoid began early in the month and we noticed the coincidence right away, and I assigned both of our milk inspectors to the case and they investigated everything about those dairies that we could possibly get hold of. We could locate nothing. Now, the most remarkable thing to my mind in this matter is, and I had to treat it as a coincidence, that the output of these dairies is efficiently and thoroughly pasteurized every day. In fact he does an extra pasteurization because I had a little controversy with him a few days before this happened and I told him that I was going to score him according to the lowest dairy from which he took milk, because in mixing the product, it was my opinion that he should have the score of the lowest dairy from which he took milk. He took it from dairies that scored all the way from 70 to about 86, so he has been pasteurizing with 145 degrees for 30 minutes, a thorough pasteurization, and it is one of the most remarkable cases I know of that all those 9 cases should take their milk from one house that thoroughly pasteurized its milk.

Dr. Ada E. Schweitzer, *Indianapolis:* We have done some work in the detection of typhoid carriers and a case that recently came to to our attention may prove to be of special interest. Not very long ago a woman came the laboratory, carrying a small baby in her arms, with a story. She said that the local board of health in a town in the northern part of the state had quarantined their milk supply. Her husband was a dairyman and had recently built a new milk house and gone to some considerable financial expense in fixing up their farm and having everything in a sanitary condition, but the local board of health had detected cases of typhoid along the route of this dairyman. The water supply had been found to be unquestioned and the milk supply was the only thing on which they could base a contention for carrying the typhoid infection. She was suspected of being a carrier. They wanted an examination made of this woman and had asked her to go to the local hospital. She did not understand that it would be necessary to have a series of experiments in case the first proved a negative. She went to the hospital, had the specimens taken and then went to her home, but she felt that she was not being used fairly by the local health department and came to Indianapolis and asked the State Department to make the examination. She went into the hospital and had specimens taken at intervals. As soon as she went in, we took a specimen for Widal test and there was only a partial agglutination. The specimen taken on the second day, however, proved positive. Then the tests were made from specimens of feces taken at successive intervals, and the first specimen proved negative. A specimen taken at a later time proved positive and we found that she was a typhoid carrier. The history showed that she had had typhoid nine years before and had practically forgotten all about it. She was a young woman and they had had no typhoid in their own family. There were a number of cases traced along this route and a number of deaths in some of the towns supplied from this dairy.

Miss Wade: I would like to emphasize one fact that I think is of great importance and that is the running of the Widal test at a low dilution when looking for carriers. Our routine dilution for our regular work is one in fifty, using the dried blood method, but for carriers I believe we should use a dilution at least as low as one in twenty-five and in a very suspicious case, go down as low as one in ten. Doctor Schenck spoke of a case of typhoid infection in which the milk was pasteurized. He did not say whether it was pasteurized in bulk or in bottles. If it was pasteurized in bulk and bottled latter, there would be a chance for typhoid contamination from a carrier. Regarding a positive Widal reaction following vaccination I would say that subject is being presented in a paper downstairs in the Laboratory Section. Our general conclusion is that if, in a large series of cases, Widal reaction is absent, then there is some trouble somewhere. You should get probably at least 90 per cent. of positive Widal reactions following administration of the vaccine. I am speaking of the vaccine made according to regulations of the United States Army Medical Corps.

Dr. Krumwiede, *New York City:* Miss Wade

has brought out the question of the intermittence of excretion, and there is one case in New York City that turned up recently. Bellevue Hospital is in the habit of not discharging any typhoid cases without three negative examinations and I was detailed to investigate a death that occurred from typhoid fever after vaccination and I found that the mother of this woman was a typhoid carrier and had been discharged from Bellevue after three negative examinations, so we cannot absolutely rely on that matter to prevent the escape of carriers from the hospital. The other thing is an epidemic that I had the opportunity to investigate, and we took the Widals for all the hands on the farm and found one who gave a suspicious reaction, but we could not find typhoid bacilli in the stools. We got stools from all employees and found typhoid bacilli in stools of one that did not give a reaction. Well, we were worried about this and meanwhile, the man who gave a negative reaction, gave a partly positive reaction and was under suspicion, left the farm. We then excluded this man we found that had typhoid bacilli in the stool and the epidemic promptly and sharply ceased. We kept that man under observation for six months and he never had typhoid bacilli in the stool again, and about three months later the other man returned to the farm and they had another outbreak of typhoid and found typhoid bacilli in the stools. In other words, I might say, we investigated the conditions; there could be no question about substitution of specimens or mix-ups, so we had a typhoid carrier that was intermittent and, what I think we forget too often in relation to diseases, we had present a normal transient carrier, and the point I want to bring out is the importance of the normal transient carrier and that carrier may be the source of infection and will not give a Widal.

THE SANITATION OF SAND PILES.

WALLACE A. MANHEIMER, PH. D.,
The Department of Bacteriology, Columbia University, New York.

THERE are several hundred sand piles in New York City, maintained either at public expense or by private subscription. The former are controlled by three different city departments, the Department of Parks, the Public Recreation Commission, and the Department of Education. Associations such as the parks and playgrounds association, church organizations, private kindergartens, playgrounds on the roofs of apartment houses, etc., maintain sand piles or sand-boxes in which children play. It is evident, therefore, that the existence of unsanitary conditions in sand piles affects the health of a great many of the young of our city.

Sand piles are usually situated under cover of permanent sheds, and under tents. Many, however, are protected from the sun by trees, or by the shadow of houses, while a few are exposed to the glare of the sun. Of the sand piles examined by the writer, all except No. 11, were supervised by playground teachers. There are, however, many unsupervised sand piles, installed by the Department of Parks, which are renewed, as are the others, when the quantity of sand becomes diminished through scattering. In most cases, it was found, the sand used was the common building sand, which when damp retains the moisture for a long time. In a few places, white quartz-sand was employed, and this in every case was drier than the building sand.

Children are never refused permission to use the sand pile. In a few cases children with wet and soiled diapers were seen sitting in the sand, thus adding pollution. It was also observed that the secretions of the nose and mouth became mixed with the sand. Since the large majority of infections are transmitted by the agency of the buccal, nasal and alvine discharges, and since these materials become to a greater or lesser extent mixed with the sand, the sand pile becomes a possible source of infantile infectious diseases.

At present, sand piles are not disinfected or cleaned in any way. The old sand, furthermore, is never removed, the new sand when added being merely dumped on top and allowed to mix with it. Stray dogs and cats have often been observed to pollute the sand pile, and complaints about this have frequently been made to the park attendants.

BACTERIOLOGICAL INVESTIGATION.

Samples of sand were collected, in sterile bottles, from eleven sand piles on the lower West Side of New York. These piles were selected because the neighborhoods were about the average, being neither the worst nor the best in New York. One gram of the sand so collected was added to 5 cc. of salt solution in a tube, and then vigorously

shaken. From this dilutions were made in the usual way, and plated on standard meat infusion agar.

The results of the analysis are shown in the following table.

Park no.	No. of children using sand pile per day.	Sand used without renewal for	Bacteria per gram of sand at 37° C.
1	40 to 60	2 months	288,000
2	75 to 100	"Several weeks"	710,000
3	200	2 weeks	28,000
4	150	1 day	30,000
5	60	"1 or 2 weeks"	48,000
6	125	1 month	450,000
7	50 to 60	1 day	20,030
8	?	?	216,000
9	60 to 100	1 day	14,490
10	100 to 150	1 day	17,000
11	?	?	374,000
Control samples, average of four tests			6,000

The control samples gave counts averaging 6,000 bacteria per gram of sand. The counts obtained from sand used for one day, exceeded 15,000 bacteria per gram. The large number of bacteria present after so short a time, can readily be accounted for by the fact that the old sand is not removed, and mixes with the new, thus polluting it. The counts from sand used for more than one month exceeded a quarter of a million bacteria per gram. To give an instance of the poorest condition found, we cite sand pile No. 2. The cubic capacity of this pile was small and the daily attendance relatively large. Furthermore the sand had not been renewed for several weeks, and was obviously very dirty. It will be seen by referring to the table that the bacterial counts exceeded 700,000 per gram, which is indeed very high.

Tests with Pathogenic Bacteria.

Although the danger of infection from sand piles is mainly one of immediate or direct contact, it was felt necessary to determine how long pathogenic bacteria could survive under conditions which obtain in sand piles. Accordingly four experimental sand piles were set up in the laboratory, two of which were sterilized, and two mixed with laboratory dust.* Twenty-four-hour cultures of diphtheria bacilli, and paratyphoid bacilli, from agar slants, were suspended in salt solution in separate test tubes, and small quantities of each mixed with the sand piles as follows: One cc. of the diphtheria suspension was added to sand pile No. 1 (sterilized), one cc. of the same diphtheria suspension was added to pile No. 2 (mixed with laboratory dust), one cc. of the paratyphoid suspension was added to pile No. 3 (sterilized), and finally, one cc. of the paratyphoid suspension was added to pile No. 4 (mixed with laboratory dust).

Tests conducted for one week may be briefly summarized as follows. In sand piles No. 1 and No. 3, which contained, in previously sterilized sand, diphtheria and paratyphoid cultures respectively, there was no marked

* Laboratory dust, which contains large numbers of bacteria, was added to the sand piles, so that the pathogenic bacteria subsequently added would be subjected to the same sort of biological competition they would undergo in sand piles used by children.

reduction in the number of bacteria present per gram of sand at the end of seven days. The sand piles had been exposed to diffuse light at laboratory temperature (70°F.). In sand piles No. 2 and No. 4, to which laboratory dust containing many bacteria had been added, and which contained diphtheria and paratyphoid bacilli number of days, thus making safeguards necessary.

Disinfection.

For the purpose of study a miniature sand pile was set up, consisting of 300 grs. of white quartz sand. This was sterilized in the autoclave and artificially infected with a pure culture of

"A crowded sand pile." (Loaned through the courtesy of Mrs. Robert G. Clarkson.)

respectively, there was marked diminution of these bacilli, though considerable numbers were alive at the end of the seventh day. While it may be argued that the bacteria suffer a continuous reduction of virulence, or that there is a selective dying off of virulent varieties, nevertheless pathogenic bacteria added to sand in sand piles will remain alive and active for a colon bacilli. This infected sand pile was dried over night in the incubator. A bacteriological count made the following morning showed that there were twenty colon bacilli per gram of sand.

Without giving details of the various experiments it was determined that ten cc. of a solution of calcium hypochlorite, containing one part of avail-

able chlorine to one thousand parts of water, sterilized the miniature sand pile in ten minutes. This sand pile which had been dampened by a quantity of hypochlorite equal to one thirtieth of its volume, dried out in the laboratory (temperature 80 to 85°F.) within three hours.

In practice, the hypochlorite solution should be added at night by means of a garden sprinkling can, thus a more dilute solution might be used since the time of exposure would be longer. There would probably be no odor to the sand the following morning. In case of a slight odor, however, thorough raking of the sand would remove it. The minimum quantity of liquid to be added should be one thirtieth of the volume of the sand, so as to insure thorough contact with the chemical. It might be thought that sand piles if exposed to the sun would be continually disinfected. As a matter of fact the sun does not penetrate deeply enough to produce marked results. Sand pile No. 11 was continually exposed to the sun, yet the counts reached 374,000 bacteria per gram. Furthermore, sand piles exposed to the sun subject the children to needless discomfort.

Conclusions.

1. Sand piles are considerably polluted, as indicated both by observation and bacteriological analysis, and may be, therefore, sources of immediate contact infection.

2. Diphtheria bacilli, paratyphoid bacilli, and probably, therefore, other pathogenic bacteria, can live for several days in sand piles, and even though they may suffer reduction both in virulence and number, the mere possibility of their presence and persistence is indicative of the necessity of safeguards. Hence sand piles may be sources of infection over more or less prolonged periods of time, as well as by immediate contact.

3. White quartz sand, instead of building sand, should be used for sand boxes.

4. Sand boxes should be protected at night from stray cats and dogs, by means of wire screens.

5. The sand should be placed over boards to insure rapid drying.

6. Before adding new sand, the old should be removed, or at least thoroughly cleaned.

7. Children with soiled diapers and children with noticeable infections should be excluded.

8. The sand should be treated every night with a disinfectant. A quantity of one to a thousand hypochlorite of calcium solution equivalent to one thirtieth of the volume of sand, will kill none-sporebearing organisms in ten minutes.

REPORT OF THE STANDING COMMITTEE ON MORBIDITY STATISTICS.

SECTION ON VITAL STATISTICS, AMERICAN PUBLIC HEALTH ASSOCIATION, JACKSONVILLE, FLA., 1914.

COMMITTEE.

John W. Trask, Assistant Surgeon General, United States Public Health Service, Chairman.

Chas. F. Boldman, Director, Bureau of Public Health Education, Department of Health of the City of New York.

Wm. H. Davis, formerly Vital Statistician, Boston City Department of Health.

F. S. Crum, Assistant Statistician, The Prudential Life Insurance Company of America, Newark, N. J.

John B. Andrews, Secretary, American Association for Labor Legislation, New York, N. Y.

YOUR committee on morbidity statistics in making this, the first committee report on the subject, thought that it would best serve the purposes for which it was appointed by discussing and reporting for your consideration the following:

1. The relationship of morbidity statistics to morbidity reports.
2. The nature of morbidity reports.
   a. The reasons for requiring them.
   b. When, by whom, and to whom case reports should be made.
   c. The nature of data to be given in morbidity reports.
   d. Form of schedule or report blank.
3. The work of the health department upon receipt of case reports and the uses (other than statistical) to be made of these reports by the health department.
   a. Verification of the diagnosis and essential data of case reports.
   b. The obtaining of supplementary epidemiologic data.
   c. The uses to be made of case reports in the control of disease.
      1. Infectious diseases.
      2. Occupational diseases.
      3. Venereal diseases.
      4. Diseases of unknown origin.
4. Statistical treatment of reports of infectious diseases, the information to be derived therefrom, and the uses thereof.
5. Statistical treatment of reports of occupational diseases and injuries, the information to be derived therefrom, and the uses thereof.

Your committee therefore begs to submit the following report:

Morbidity statistics are obtained by the collection and numerical classification of data relating to recorded cases of disease. The principal source of this information is the official records of notifiable diseases obtained primarily from the reports of practising physicians. In considering morbidity statistics we need first to consider the

morbidity reports from which they are derived.

The practice of requiring the notification of cases of the controllable diseases owes its existence to the assumption that communities desire to prevent the occurrence of these diseases and are responsible in a way for the cases that occur.

The Reasons for Requiring Morbidity Reports.

The reasons for requiring reports of cases of the controllable diseases are:

1. That the interests of the patient may be protected and that he may receive suitable and proper care and treatment.

2. That the disease may be prevented from spreading from the patient to other members of the community.

3. That the factors or conditions that produced the disease in the patient may be removed, or so modified that they will not do similar injury to other members of the community.

4. That, by recording facts in regard to the time, place, and conditions of occurrence of cases of diseases, knowledge of their causes or means of spread hitherto unknown may be obtained which will be of value in the control of these diseases.

5. That, by having a means of promptly learning of the occurrence of disease, the community may have a current indicator of the status of the community as relates to disease and of the efficiency of its sanitary work.

6. That the compiled, classified, and analyzed records in the form of morbidity statistics may give to the community a record of the relative prevalence of disease from year to year and under varying conditions, and show the effect of public health measures and of sanitary work.

These being the purposes of the notification of cases, morbidity reports presuppose the existence of an agency which, upon receipt of the case reports, uses them for the protection of the patient or the community. Health departments and morbidity reports go together, each is useless without the other. The health department is helpless without the knowledge of the occurrence of disease given only by case reports, and case reports have no object unless there is a health department to act upon the information which they give.

The use of case reports for the protection of the patient is becoming more and more common. An illustration of this use is the requiring of the reporting of all cases of ophthalmia in the newborn for the protection of the eyesight of those affected. Every case of ophthalmia neonatorum should be under the observation of the health department to the extent that it may be ascertained that proper treatment is being given and if necessary it should conduct the treatment itself. Vision is too important to the individual and its loss too great a misfortune to run any risk of the sight of helpless infants being damaged due to the neglect of their responsible adult guardians, and in this sense the health department and the community at large, as well as the immediate household, must be considered as constituting the guardians.

Since it has been learned that the

early use of diphtheria antitoxin has an important bearing upon the recovery of those affected with diphtheria, many communities have adopted the practice of furnishing antitoxin, more particularly to those who would not be likely to use it because of the expense. Every case of diphtheria should be under the observation of the health department to the extent that it may know that the patient's interests are being protected and that he does not fail to receive antitoxin because of ignorance or poverty.

Communities have begun to assume the responsibility of providing for consumptives who, because of the expense, would otherwise not have necessary care and proper surroundings. Such a plan can be carried out systematically only when all recognized cases are reported.

Epidemiologic studies have demonstrated that infectious diseases are directly or indirectly communicable in various ways, that some of these diseases are spread from person to person by obscure and devious routes. To such an extent is this true that the danger of an individual's contracting disease from the sick he knows of among his associates and neighbors is frequently less than the danger from the many sick of whom he has no knowledge and of whose existence he is unaware. Children in day schools and Sunday schools are exposed to the communicable diseases of many homes. In street cars and at churches we come into contact with those from distant households. The common fly makes neighbors of us all. The purpose of the health department is to protect the individual from infection through the spread of disease from the sick of whom he has no knowledge and against whom he is unable to protect himself. It is further the function of the health department to protect the individual from remediable disease-producing agencies. This protection can be extended only by the aid of the information furnished by case reports.

There is a class of diseases and disabilities which are not communicable but are due to remediable conditions. Examples of this are the diseases known as industrial or occupational. The only means by which the conditions which produce these can be discovered and remedied is by recognizing the cases as they occur and ascertaining the place at and conditions under which each was produced. To prevent occupational diseases it is necessary first to recognize the disease, then discover the conditions which produced it, and finally render the conditions harmless for further injury. If we do not recognize the disease, we cannot know that it exists. If the disease is recognized and not reported to those responsible for its control, the disease might as well not have been recognized, so far as the community's welfare is concerned. If the authorities have been informed of the existence of the case and take no measures to make it impossible for others to be similarly injured, the recognition and notification of the cases have been in vain.

Incidentally the accumulated records of cases of disease show its prevalence and the conditions under which it occurs, for disease is as widespread as

cases, and there is no distinction between the prevalence of disease and the occurrence of cases. These accumulated records have been and will continue to be of value in revealing epidemiologic facts regarding disease and of service in ascertaining the causes of disease of unknown origin. They have shown the changing virulence of disease under varying conditions of season and climate, and at different times. Used with mortality records they have shown the effects, or the absence of effect, of medical or other treatment upon the course of disease.

Accumulated in masses, compiled, classified, and analyzed, case records constitute morbidity statistics. The experience of an individual, or of one community, or of a large population for one year, cannot give a comprehensive picture of a given disease, and if we are to know disease, the conditions under which it occurs, its effects, its fatality rates, and, for that matter, also the effects of treatment, it can be only through a study of the conditions under which cases occur, their course, and termination over a period of time, in many localities, and as observed by many people. This constitutes morbidity statistics. It is upon this that the future, not only of public health and preventive medicine, but of the practice of medicine itself largely depends.

To Whom, by Whom, and When Reports Should Be Made.

To Whom Reports Should be Made.—Cases should be reported to the health department inasmuch as the purpose of case reports is to give to that department information by which it can protect the community or, in some instances, the patient himself. A peculiar provision will be found in a number of state statutes requiring that cases of ophthalmia neonatorum shall be reported to a practising physician. Such a requirement is anomalous, for the physician has been given no official responsibilities. The physician does not represent the community. The only representative of the community in such matters is the health department or some official designated for the purpose.

By Whom Reports Should be Made.—Reports should be made by those able to recognize cases. In the practising physician we have one presumably able to recognize cases of the notifiable diseases and also one who, because of his work, comes in contact with such cases. Under the present organization of society and in view of existing customs the person upon whom the responsibility for the reporting of cases of the notifiable diseases must, in most instances, be placed, is the practising physician, although it may be desirable to include others in this responsibility, such as the head of the family or household, or the attendant or nurse, and to require that in the absence of a physician one of these shall make the report. As a matter of fact, when the requirements as regards physicians are enforced the reports made by the others will in most instances be quite immaterial.

When Reports Should be Made.—Cases should be reported as soon as recognized, and for many diseases as soon as suspected. Each health de-

partment should have in its employ an expert diagnostician of the notifiable diseases. The physician will be doing the community and the health department the greatest service by reporting a case as soon as it is suspected to be of a notifiable nature. The diagnostician of the health department can in the interests of the community observe the case and determine its nature.

The Nature of Data to be Given in Morbidity Reports.

In the future, when civilized man determines to protect himself from disease with the same care that he now takes to protect himself from the armed forces of rival nations, the data which will be recorded of each case of controllable disease recognized will be in considerable detail. For the present, however, while we have much to learn as regards the control of disease, and with the existing standards of medical training, it is impracticable to require anything but the most essential data and those which are most easily furnished and most likely to be accurate. The following may be considered to include all the data which can be properly asked of the practicing physician and which are likely to be furnished in a manner worthy of record.

The date when the report is made.

The name of the disease or suspected disease.

The name, age, sex, race, occupation, address and school attended or place of employment of the patient.

Number of adults and of children in the household.

The physician's opinion as to the probable source of infection, or of the origin of the disease.

If the disease is smallpox, it should be stated whether it is of the mild type or the virulent type, and the vaccination history of the patient should be given.

If the disease is typhoid fever, scarlet fever, diphtheria, or septic sore throat (diseases spread through milk) information should be given as to whether the patient was, or any member of the household is at the time of the report, engaged in the production or handling of milk.

The reporting physician should sign his name and give his address.

There are many diseases in which the efficient health department will want to have much more detailed information regarding each case. The practicing physician, however, should not be asked to give this information. The health department's representative is the only person who can be expected to be properly trained to ascertain accurately in such instances detailed epidemiologic data. In fact, the well equipped health department would not be willing to depend upon the epidemiologic data furnished by practicing physicians in general, most of whom have had little experience or training in this kind of work.

Form of Schedule or Report Blank.

The most convenient form of report blank is believed to be the postal card. This does not require the addition of postage, a thing which the physician should not, when practicable, be asked to furnish.

Statistical Treatment of Reports of Infectious Diseases, the Information to be Derived Therefrom, and the Uses Thereof.

1. Information to be Derived from Reports of Infectious Diseases.

In the provisions of the Model State Law for morbidity reports the following facts, susceptible of statistical treatment, are required:

1. Date of report of sickness.
2. Name of disease or suspected disease.
3. Age of person reported.
4. Sex of person reported.
5. Color of person reported.
6. Occupation of person reported.
7. Address of person reported.
8. Source or probable source of infection, or the origin or probable origin of the disease.
9. In cases of smallpox, number of successful vaccinations, and dates of such vaccinations.

It will be observed that the facts required are quite limited, but, if fully reported, they will serve admirably as a guide to the quantity of infectious disease in any given locality, the time of minimum and maximum occurrence, the age at which susceptibility is greatest, whether or not there are important sex differences, and whether or not negroes are more or less susceptible than whites to the various infectious diseases. The occupation factor is of less value in infectious diseases than in occupational diseases, but it conceivably may be of value in enabling us to measure the relative attack incidence in certain occupations or professions. For illustration, the special hazards incident to nurses and physicians engaged in treating highly contagious diseases such as smallpox and diphtheria can ultimately be quite accurately determined on the basis of case reports under the Model State Law. Perhaps the term *Race* might profitably have been substituted for *Color* in the Model Law. The reports will often read "colored" and in such cases it will frequently be impossible to determine whether the reported person is Negro, Indian, Chinese or Japanese.

Provision is made in the Model State Law for securing information that will make it possible in the future to determine more positively than in the past the value of vaccination as a prophylactic measure in smallpox. The State Law might have gone a step further and required the same information in cases of typhoid fever. Anti-typhoid vaccination is becoming quite general in certain sections of the country and it is highly desirable that information as to the immunity secured by this treatment become available at the earliest moment possible.

2. Statistical Treatment.

The statistical treatment of morbidity reports should be such as best to serve two general purposes. First, to provide the local health authority with first-aid information which will enable him to set in motion the activities necessary to check the spread of the infectious diseases which are found to be present in the community, to assist so far as possible in the proper treatment of the notified cases, and to remove the source of the disease so far as practicable. This kind of work can only be performed effectively by the local health authority when complete and early reports of sickness cases are available to him. Obviously, such reports should greatly increase the efficiency of the local health authority in its chief function which is to conserve the health of the community. Early knowledge of the appearance of an infectious disease is possible only when reports of cases are completely and promptly reported by the attending physicians. The local health authority has only to assemble these reports by diseases and localities to get the

knowledge necessary to set in motion his prevention activities. A statistical device quite generally used for this purpose consists of colored pins and maps. With this device the exact location and number of cases of the various infectious diseases present in a given community can readily be shown in a simple but graphic manner. This method is especially adapted to small cities. In large cities the same purpose may be achieved by assembling the reported cases on cards arranged by streets. For this immediate purpose, the health authority does not need to consider factors of age, sex, race, etc. He is primarily interested in the kind of infectious disease, the number of cases, and the exact location of the same.

The second purpose of statistical presentation of infectious disease reports is to put the morbidity experience in such tabular form that all the essential items may be readily compared in time, that is by days, weeks, months, and years; and in place, that is, by geographical or other divisions such as streets, wards, cities, counties and states. In these permanent tabulations it is important that sex and age be carefully distinguished and also, wherever the race factor is of sufficient importance, it should be taken into account.

As there is no provision in the Model State Law for a second report by physicians to notify the termination of cases by death or cure, we cannot hope to secure information as to the relative duration of the various notifiable diseases. The case fatality-rates of infectious diseases can be calculated if the reports of cases are complete. The true case fatality-rates, however, cannot be calculated by weeks and months unless the fatal cases are measured against the non-fatal cases of the week or month of first-notification. At present the method in common use is to measure fatal cases against cases notified the week or month that the deaths occur. This gives untrue results and the distortion of facts is likely to be considerable when an epidemic is on the wane.

3. Uses of Statistics of Infectious Diseases.

I have already hinted at some of the uses of statistics of infectious diseases. First of all these statistics enable the local health authority to check the spread of contagious disease by giving him information as to the place of their occurrence. Secondly, when tabulated by weeks, months, and years, seasonal fluctuations can be noted and possible periodicity of occurrence can be discovered. In that event an epidemic year might be anticipated and to be forewarned is to be forearmed.

Thirdly, by noting the factors of age, sex and race the attack incidence of a given disease can be calculated, its comparative case fatality by age, sex and race can be determined and more definite knowledge can be had of the effects of the various diseases—under what conditioning circumstances of time, place, age, sex and race a given disease is apt to be most prevalent or most fatal. Obviously the knowledge of these facts will be of great value to health authorities in any campaign of disease prevention.

Fourthly, by comparison of the prevalence of the various diseases, their increase or decrease, and the relative effects of preventive methods of various kinds, the health authorities may finally come to an agreement on the best preventive methods applicable to the specific infectious diseases. For illustration, a careful analysis of a large body of statistics ought to enable us to determine with more accuracy than has heretofore been possible the relative value of sanatorium treatment of tuberculosis.

Fifthly, in the statistical treatment of such a disease as smallpox the value of vaccination as an immunizing agent can be definitely determined on the basis of large numbers, for it is assumed that the local statistics will in most cases be ultimately combined in state reports, which in turn will be consolidated in national tables which will include the data from the entire morbidity registration area.

Statistical Treatment of Reports of Occupational Diseases and Injuries, the Information to Be Derived Therefrom, and the Uses Thereof.

1. Legislation.

Accidental injuries occurring in factories and workshops have been reportable for some years in at least twenty-five states, the reports in a few instances tobe made by physicians but in practically all cases by employers, and to be sent to the state labor departments. Beginning in 1911 reporting has been further emphasized in many states by workmen's compensation laws. In two or three of these states notification to compensation commissions relieves the employer of further obligation to report. Most mining states also require accidents in mines to be reported, usually to the mine inspection officials, and in no fewer than thirty-three states accidents on railroads and other public utilities must be reported to a public service commission. Railroad accidents are also reportable to the Interstate Commerce Commission.

Within the past five years fifteen states have provided for the reporting of occupational diseases. No less than five of these states require monthly medical examination of employees in especially unhealthful employments such as the manufacture of white and red lead, and also make it the duty of the examining physician to send reports to the proper state authorities. In the remaining ten states it is the duty of all physicians to report to state authorities certain specified occupational diseases and in three of these any other ailment or disease which the physician believes to be due to the nature of the employment is likewise reportable.

2. Standard Schedules.

In 1911 the American Association for Labor Legislation, after numerous conferences with public officials and practical safety and sanitary engineers, drafted standard schedules for the uniform reporting of industrial accidents and occupational diseases.

Nearly one-half of the total manufacturing population of the United

States is now working under the standard schedule for accident reports. Among the leading states which have already adopted this standard form are California, Iowa, Massachusetts, Minnesota, Nevada, New Hampshire, New York, Pennsylvania and Washington. The standard form has also been adopted by a number of manufacturing corporations and insurance companies, while several influential organizations have endorsed it and are now working for its general adoption.

The standard certificate for occupational disease reports has been adopted by no less than nine states, including California, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio and Wisconsin.

3. *Proposed System for Uniform Tabulations.*

At a convention of the International Association of Labor Commissioners held in Washington, D. C., in 1912, the writer suggested a plan for uniform tabulation of industrial injuries.

At no time in our history has there been a greater demand for reliable information prepared and presented in a form which will make it possible to compare the experience of one state with that of another. This interest, which is nation-wide, applies to nothing more urgently than it does to the closely related problems of industrial accidents and occupational diseases. To meet the need for information treated from the national industrial point of view it is believed that the best solution is that the states place in the hands of the federal authorities selected portions of their data for treatment. To this end the following plan has been outlined:

(1) Definition of a reportable accident as one (a) causing death immediately or later; or (b) causing some permanent injury; or (c) causing absence from work for twenty-four hours or longer. The report should be made within forty-eight hours of the accident, and employers should be urged to keep a record of, although not to report, all cases where the workman is off less than twenty-four hours.

(2) Adoption in coöperating states of a form of report conforming in essentials to the standard schedule.

(3) Securing from industrial establishments, for the use of the state and of the federal bureau of labor statistics, information on the following points: (a) employment—if possible, the shop hours of the different departments, or, if this cannot be obtained, the average number employed per month and the exact number of days during which the department was in operation; (b) accident occurrences, including length of temporary disabilities.

(4) Treatment of this material by transferring each record as it is completed to punched cards under a uniform code to be agreed upon, the cards to be tabulated by each state and then transmitted to Washington, or else the federal bureau may undertake to perform the tabulation for the coöperating states in return for the opportunity to combine the data for its own uses.

(5) Publication of the data thus secured in such a way that it shall be

comparable between the various co-operating states and from year to year.

4. Information Secured.

The information secured through proper systems of notification of industrial accidents and occupational diseases may be grouped under the following heads, as formulated in the standard reporting bills drafted by the Association for Labor Legislation and already adopted in several states:

(1) *Accident Reports.*

(a) Name, address and business of employer.

(b) Name, address and occupation of employee.

(c) Cause of injury.

(d) Nature of injury.

(e) Time of injury.

(f) Place of injury.

(g) Such other information as may reasonably be required by the proper official.

(2) *Disease Reports.*

(a) Name, address and occupation of patient.

(b) Name, address and business of employer.

(c) Nature of disease.

(d) Such other information as may reasonably be required by the state board of health.

These main heads are capable of detailed expansion to embrace all the data called for by the standard schedules and certificates already referred to.

5. Utilization.

Every person in the community is directly concerned in scientific efforts to conserve the health, vitality, energy and industrial efficiency of wage-earners. In order that the necessary mechanical and other precautions may be taken, the state should be enabled to determine where and how men are exposed to the industrial perils which menace them. The legislation here outlined is part of a country-wide organized effort to arouse more active interest and coöperation among employers, employees, physicians and inspection officials, and to secure for the use of factory inspectors a regular supply of information from those who should be best informed on actual conditions. Information thus secured should indicate the danger spots and the disease foci of industry, and factory inspectors, instead of being mere detectives, can become helpful coöperators in the field of industrial safety and hygiene. They will be in a position to suggest to manufacturers requisite, and in many cases simple and inexpensive, safeguards, and to instruct employees in the use of measures for the prevention of unnecessary suffering and death.

Most potent among the factors pressing for the better reporting of the accidents and diseases of industry is the rising tide of workmen's compensation legislation, which within five years has spread to twenty-four states, or exactly one-half of the country. Only two large areas—the solid south broken only by Kentucky, Louisiana and Texas, and a Rocky Mountain strip extending eastward over the Dakotas—are still backward and untouched by the forward-sweeping wave. The vast majority of the manufactur-

ing population of the country is now covered by this protection. Already in Massachusetts occupational diseases as well as accidents are embraced in the compensation law. Justice demands that other states include at an early date provisions which shall indemnify those incapacitated by occupational disease no less than those incapacitated by accident. With compensation legislation has come at last the certainty as well as the necessity for accurate and scientific reporting. Scientific tabulation of results then becomes a vital issue. The greatest function of compensation laws, the *prevention* of industrial disabilities, as well as the nominal function of rendering financial amends for those disabilities which nevertheless do arise, must be halting in its operation in the absence of a system of accurate, complete and comparable statistics such as is aimed at by the proposals here made.

Book Reviews.

The House-Fly, Musca Domestica Linn.: Its Structure, Habits, Developments, Relation to Disease, and Control. *C. Gordon Hewitt. Cambridge: The University Press, 1914. 15+382 pp., 104 ill., 8 vo. G. P. Putnam's Sons, New York. Price, $4.50.*

Amid the growing literature covering the insects that share our homes, the present work will take an important place by reason of its completeness.

There are no less than fourteen species of flies that frequent houses, but the house-fly proper, named by Linnæus *Musca domestica*, is usually by far the most abundant. When large numbers of flies in a given locality have been examined, the proportion of *M. domestica* to other species has been found to be from 87.5 to 98.8 per cent. Hence this book is chiefly devoted to the common species, but the others are not neglected.

The scope of the work may best be indicated by a summary of the contents of the six parts of which it is composed.

In the first part there is a description of *M. domestica*, and a detailed account of the anatomy of the adults and of its distribution and habits in regard to food, temperature, and the like. The second part takes up the breeding habits, life-history, and the anatomy of the larva of the same species. In the third part we find an account of the enemies of the house-fly and its parasites. The other species that frequent houses are treated more briefly in Part IV. Then follow two parts of especial interest to sanitarians. The first of these treats of the dissemination of pathogenic organisms by flies,—one of the six chapters in this part being devoted to typhoid fever and another to the summer diarrhea of infants. The concluding part deals with the means of preventing the breeding and spread of flies, and with organized efforts to control them.

The anatomical part of the book is perhaps the least satisfactory. It would be better if the chapters dealing with the anatomy of the adult and of the larva were brought together. Some of the anatomical descriptions are hard to follow. This is particularly true of the account of the mouthparts of the adult, which is unintelligiable for any one not an entomologist, and should be rewritten.

One of the most interesting and instructive chapters is the one on the feeding habits of the house-fly, including, as it does, some valuable, if unpleasant, original observations by the author on the nature of fly specks.

The part on the enemies and parasites of the fly appears to be full and adequate. It deals with the habits and life-histories as well as the adult structure of these useful organisms. The most important of these checks on the increase of flies seems to be the familiar fungus, *Eupusa muscæ*. The closeness of the association of the house-fly with the horse is shown by the fact that the former is the intermediate host for a nematode worm that finds its definitive host in the latter.

Of special interest and value is Part V, occupying about a third of the book. Here is set forth in detail the evidence against flies as carriers of the germs of disease. This part gives a useful summary of the extensive literature on the subject. In this connection, however, it should not be forgotten that flies in themselves are not dangerous. They become so only when allowed access to excretions that contain pathogenic organisms. The first problem of sanitation, therefore, is the control of dangerous excretions. The control of the fly is secondary.

The book is well printed on paper with a dull finish pleasant to the eye. Most of the illustrations are original and are well drawn, but in some cases the labeling and the descriptive legends are inadequate. The colored plates are so good that one wishes there were more of them.

Although not intended for a popular treatise, this book deserves a wide circulation; and it should be read by all who are interested in municipal or rural sanitation.

R. P. Bigelow.

Public Health in Springfield, Ill. *By Frank Schneider, Jr. A Survey published by the Department of Surveys and Exhibits of the Russell Sage Foundation. New York, 1915. Price, 25 cents.*

A number of surveys of health conditions in different American cities have appeared in recent years and several by the author of "Public Health in Springfield" but this is among the best. The report is well arranged, proceeds logically, is easy to read and though containing less than 150 pages, with appendices, has both table of contents and index.

The relation of the character of the population to health is discussed and while Springfield has a smaller proportion of foreign-born and negroes, than eastern and southern cities, these groups are concentrated in certain wards and this goes far to explain the greater mortality in these districts. Infant mortality properly receives first attention as affording the most promising field for life-saving. Its causes and variations in different parts of the city are well analyzed and the author's contention is well founded, that by proper preventive measures, chiefly baby welfare stations and visiting nurses, the infant mortality rate can be nearly cut in two. Of course, complete birth registration is a prime requisite and the fact is wisely emphasized, that, even if it led to no life-saving, the record of the birth of each child is imperatively demanded for the maintenance of its social and legal rights.

The control of the common contagious diseases of children is well handled and the advice given is eminently practical and evinces a familiarity with our latest knowledge of the subject. Prompt reporting, while an essential, accomplishes little, unless there is efficient control. The trained epidemologist and the visiting nurse are what counts, that is, prompt personal investigation and direction of each case by skilled men and women. The time has gone by for mere profunctory visit by a "sanitary inspector" and a "disinfector."

Then follow chapters on tuberculosis, typhoid fever and venereal diseases, the one on tuberculosis being by Mr. Van Blarcom, and forcefully urges the accepted methods of control such as education, a hospital, a dispensary, open-air schools and nurses. The chapter on typhoid fever shows that the former excess of this disease was due to a polluted public water supply the improvement of which caused a marked reduction in the typhoid death-rate. There are, however, 7,530 surface wells in this city of less than 60,000 people, and 7,431 privies, and it is difficult to see how a typhoid death-rate of less than 20 per 100,000 can be maintained under these conditions. That it has been so reduced is remarkable and speaks well for the intelligence and personal habits of the people, characteristics, however, upon which the tolerance of these conditions would throw doubt! To combat the venereal peril are recommended conservative education, notification, laboratory diagnosis, and free dispensary and hospital service.

The author divides his subject into a consideration of the control of infection in persons and the control of inanimate environment. In the latter, as in the former part, he insists on essentials. The water supply must be pure and adequate so that there may be no excuse for surface wells. While the necessity for ultimate sewage purification is recognized, the prompt removal of all privies is a more presing demand. The milk supply must be improved and efficient inspection maintained and pasteurization is recommended. The greatest danger in handling other foods is fecal contamination, and the menace of improper toilets and privies, in and near bakeries and stores, is forcibly touched upon. Improper disposal of stable manure is also strongly condemned but not much is said about garbage disposal, street sweeping or "clean up" weeks, matters which have little to do with public health.

It is interesting, though not surprising, that Mr. Schneider, who is not a medical man, should give so much more attention to persons than to things in public health work. The fear has been expressed that non-medical men would do quite otherwise. While Mr. Schneider would not venture to diagnose an ailment in man he does diagnose most successfully the ailment of communities and recommends the appropriate remedies which involve, for their chief functions, the employment of physicians and nurses skilled in the diagnosis and treatment of the diseases of persons. He even goes much farther than many, but no farther than he should, when he advises the assumption of the general care of the sick poor by the health department as economical and bringing to the latter much useful

knowledge of disease and affording new opportunities for preventive work.

Mr. Schneider has evidently read many of the voluminous sanitary codes made to order, for he says: "It would seem, however, not so important to have a new code complete in every particular (many provisions of which could not be enforced with the present staff), as that the health officer be able to have ordinances passed as needed authorizing work he especially wishes to prosecute."

The whole review is especially noteworthy for its careful estimate of the efficiency of the suggested methods of disease prevention. The relation to cost also receives due attention. It is shown that the city had better spend money for epidemiologists and nurses than remodel its old contagious disease hospital if money cannot be spared for both. It is also argued that important though they are, the betterment of the water and the extension of the sewers should be postponed until the health department is put on a modern basis, for the latter will save more lives, and at a less cost, than the former.

Lastly Mr. Schneider urges a combination of county and municipal health departments as being the best and most economical for that particular community.

Charles V. Chapin.

An Introduction to School Hygiene. *By W. B. Drummond. Longmans, Green & Co., New York and London.*

This book, which is intended especially for teachers, is written in the clear, incisive style which characterizes all of Dr. Drummond's well known books. He has already published a treatise on physiology for teachers so that this subject is not touched upon in the present work. The book was written for the English school teachers and a number of conditions exist in the British schools which are not found in American school-rooms. As an instance, the arrangement of meals in this country does not include the inevitable five o'clock tea which is a part of the daily life of all classes and all ages in England.

In discussing the age at which children should go to school, Dr. Drummond states emphatically that he does not believe that any child should be permitted to attend school previous to six years, and preferably seven. In France the school age is six, while in Scotland it is five. It is well known that the chronological, physiological and anatomical ages differ in almost every case, and a child who is ten chronologically may not be more than four or five physiologically.

The chapter devoted to the teeth should be read by every teacher and the principles thereof instilled into each home. The importance of caring for the teeth of young children is becoming more widely recognized and its effect on the development and nutrition of later life is now well established. It is not an exaggeration to state that the prevention and treatment of dental caries is one of the biggest problems of child hygiene.

The chapter on the study of children, and the one on the day's work, can be read with profit by every school teacher and it is hoped that this book will obtain a wide circulation in this country. It is helpful and instructive to a very great degree and can be highly commended by school physicians to the teachers under their jurisdiction.

Henry L. K. Shaw, M. D.,
Albany, N. Y.

Health Department Reports and Notes.

REPORTS.

Jacksonville, Florida.

Dr. C. E. Terry, health officer of Jacksonville, commences his report with the following statement: "Were it a financial statement of a bank holding the deposits of even a small percentage of our citizens, or a balance sheet devoted to pecuniary revenues of any description; did it present to the individual as efficient means for the protection of his dollars as for that of his life and health, its pages would doubtless be eagerly scanned, the methods employed carefully studied, and it is even conceivable that the results set down might receive some degree of commendation as an economic system of interest and value. Dealing as it does, however, not with an advance in property values or capital accumulations, but with an increase in community health, and a saving of individual lives, it is extremely doubtful if the popular demand for copies will exceed one half of the limited edition available." While Doctor Terry's pessimistic view is undoubtedly true, it is certain that the health officers of the country could in many instances receive much benefit through a careful perusal of this admirable report. The population of Jacksonville for 1914 was 70,173, almost equally divided between white and colored. The crude death-rate for the year was 18.5 and the resident death-rate 15.2. It is pointed out that this is the lowest rate yet published for Jacksonville. The plan adopted in 1913 for the control of diphtheria through an active search for and the segregation of carriers among case contacts, in the schools and in the homes, has been continued with apparently good results. One of the marked advantages of the scheme is that its carrying out accomplishes public instruction concerning disease carriers in general. This has led to the early detection of cases of the disease in several instances. It will be recalled that the infectious disease hospital of Jacksonville is conducted on the contact infection idea, disregarding air transmission. The head nurse, Miss Laura J. Harris, reports on eighty-one cases of disease which were treated at the hospital. All of these patients were cared for on a single floor by the same nurses, the doors of the rooms into corridors remaining open. The only case of cross infection which occurred was one of chickenpox. This was due to carelessness on the part of one of the nurses. Doctor Terry states that he feels that the value of the sanitary privy law has been demonstrated beyond all possibility of a doubt. There was a slight increase in typhoid fever in the city during the year, but this is explained on account of the fact that typhoid was prevalent in a number of the nearby communities. The enforcement of a midwifery ordinance in 1914 has been accompanied by a marked decrease in the deaths occurring in the "tetanus period." Doctor Terry points out that, although it is too early to draw conclusions, he is inclined to believe that the reduction may be attributed to the regulations surrounding the practice of the midwives, their close supervision by the colored district nurse, and the use of sterile umbilical dressings furnished by the department. One of the most interesting sections of the report is that dealing with habit-forming drugs. It will be recalled that in addition to the usual provisions of the anti-narcotic laws, Jacksonville has an ordinance providing that physicians shall send copies of all prescriptions which call for these drugs with the name and address of the user to the Health Department. Also that the health officer may, if he deem it advisable, write prescriptions for indigent users. The records show a total of 1,073 habitual drug users. It is proposed at the next state legislature to again introduce a bill which will deal adequately with the various aspects of this great problem. Space prohibits detailed mention of the excellent report of the bacteriologist and chemist, and milk and dairy inspector. The section dealing with vital statistics is of the usual excellence of Jacksonville reports.

Richmond, Virginia.

The Forty-third Annual Report of the Richmond Health Department, the ninth report to be made by Dr. E. C. Levy as chief health officer, presents much valuable information and is made unusually attractive through the introduction of excellent colored charts. The chart showing the typhoid fever record since 1880 is reproduced here. Doctor Levy states that the year 1914 was beyond question the most successful that the department ever had. The facts presented certainly bear up the health officer's contention. The general death-rate was the lowest on record and the same is true of the death-rate from typhoid fever, diphtheria and infantile diarrhea. About thirteen square miles of territory, with a population of approximately 18,000, was added to the city the latter part of the year. The general death-rate was 19.7 with non-residents included, and 17.8 with the non-residents excluded. The typhoid fever death-rate per 100,000 was 14.1. It is interesting to compare this with the annual average of 1907 to 1909 when it was 38.4. The death-rate from diarrhea under two years was 71.9 and contrasted with 130.2 the annual average from 1907 to 1909. Mr. A. H. Straus, who has served as bacteriologist on part time during the past five years, resigned to accept a professorship at the Medical College of Virginia. On the recommendation of the health officer the Board of Health sent to the city council an ordinance increasing the salary of the bacteriologist to $2,000 a year, and making the office a whole-time one. An interesting feature of this ordinance is that it contains a provision whereby the Board of Health, in view of the importance of the work and of the technical training demanded, was empowered to employ a bacteriologist not a resident of Richmond in the event of their being unable otherwise to fill the office in a satisfactory manner. Doctor Levy in commenting on this states that he believes that it is the first instant in which it has been made legal in Richmond to fill any city position except with a "citizen and taxpayer." He hopes that this is but the beginning of a realization that city offices are, or should be, primarily for the benefit of the city and not of the office-holder. The health workers of the country will agree with Doctor Levy in this matter. Doctor Levy continues in this report his excellent plan of giving a brief history of all deaths from typhoid fever in the city during the year, with special reference to where the disease was contracted, etc. There was only one death from malaria in the city during the year. Doctor Levy reiterates his statement that the high malaria rates prior to 1908 were entirely fallacious and that the deaths recorded were either from consumption or from some obscure condition which was not recognized by the attending physician. The low death-rate from diphtheria (3 per 100,000) has undoubtedly been due very largely to the work done by the Health Department. The chief factors concerned have been the valuable work of the laboratory, the policy of liberal distribution of antitoxin, the careful investigation by the medical inspector of every reported case, and the policy of furnishing an expert consultant in laryngeal cases. 1914 was an "off" year for measles in Richmond. Doctor Levy, points out, as he has in previous reports, that measles is a disease over which we have not yet gained control. The measles chart showing the two epidemics of measles which were predicted by the health officer is particularly interesting. Those interested in the prevention of infantile diarrhea will find much of value in that section of the report dealing with this subject. The work of the nurses was unquestionably the means of saving the lives of many babies: "Case after case came to their hands in which a feeble baby had an ignorant mother under whose care the baby would almost certainly have died, but by the instruction and the actual demonstrations given by the nurses many of these babies were saved." Believing that infection plays a most important rôle in the causation of the fatal type of infantile diarrhea, Doctor Levy for the last few years has had the department nurses emphasize above all other things the care of the diaper. "The fecal matter of a community is not completely looked out for merely by complete sewerage of that community. A considerable part of this is the bowel discharges of babies, and, even though a city is 100 per cent. sewered, this portion of it does not go into it directly. Its immediate destination is the

diapers, and, unless these are cared for properly, there will still be a spread of intestinal troubles, especially among infants." Space prohibits dealing in detail with the improvements in the milk supply. The section entitled "Safe Raw Milk" will be of interest to all. With regard to whether or not milk should be thoroughly pasteurized Doctor Levy has the following to say: "Speaking plainly, we feel that there are advantages and disadvantages on both sides. We feel, furthermore, that if Richmond, with a milk supply, the excellence of which is recognized by all who have looked into it, should resort to compulsory pasteurization it would be equivalent to saying that no city can ever so safeguard its milk supply as to make it safe for human consumption without pasteurization. At the present time a considerable proportion of our milk supply is pasteurized, by the choice of the dairymen. Every person has it thus in his power to get either raw milk or pasteurized milk, whichever he may prefer, or whichever his physician may wish him to have. This, we believe is the best solution of this much debated question."

The net cost of maintenance for the Health Department for the year was $48,642.00.

No one can read this report without being thoroughly convinced of the absolute value of modern preventive medicine. This report is written in such a manner that it should be thoroughly intelligible to every interested citizen. Doctor Levy and his staff deserve the congratulations and thanks of the citizens of Richmond. Many health workers will receive an inspiration through the careful perusal of this valuable document.

Winnipeg, Manitoba.

Winnipeg spent 44.7 per capita during 1914 for strict health work. The death-rate for the year was 9.62 per 1,000 inhabitants, the lowest recorded by the department. The typhoid fever rate was 3.9 per 100,000, the lowest record, which is naturally the source of great satisfaction. One hundred six cases of smallpox with no deaths were reported. This was a considerable increase over the previous year. As usual, unvaccinated individuals furnished practically all of the cases; only two patients of the total had ever been successfully vaccinated, one a man of 54, vaccinated in infancy, the other a man of 21 vaccinated in infancy. Two thousand three hundred and sixty cases of measles were reported with 22 deaths. There was also a marked increase in the number of cases of diphtheria reported. The increase is attributed to the prevalance of the germ "carriers" and unrecognized cases. The nurses employed by the anti-tuberculosis society were taken over by the Department and given the standing of inspectors. By this means their efficiency has been much increased. The death-rates from pulmonary tuberculosis was 71.4. An educational campaign with regard to cancer was started and it proposed to follow it up. The infant mortality rate dropped from 159 in 1913 to 125 in 1914. This decreased rate is mainly due to (1) lessened mortality among infants born of mothers from southern and central Europe; (2) fewer deaths from diarrheal diseases of children aged three months or less. The Vital Statistics are admirably given. Dr. A. J. Douglas, medical officer of health, should be commended for his good work.

NOTES.

Saving Babies in the Oranges.—A report on the Baby Saving Work of the Oranges—by Edith Rockwell Hall, Field Secretary of the Committee of the Woman's Club of Orange, New Jersey, is the title of a comprehensive little report just out. The pamphlet illustrates a typical example of an admirable organization with an admirable purpose getting out a report which will fall short of reaching the people for whom it is meant. Good work has been done, and the plea and recommendations for more effort is well worded, but all this is to a great extent lost by a lack of organized and graphical presentation. The tables lack totals in many places; subheadings could be often used with decided advantage; greater brevity is sometimes desirable.

The pamphlet as well as the patient and

devoted work it betrays is commendable but a little more attention to its composition and presentation would gain for it the more intelligent and a wider reading which it deserves.

⁂

County-Wide Vaccination.—The county-wide anti-typhoid vaccination campaigns in North Carolina promise to be surprisingly popular. In one county 800 treatments have been given.

According to a press article issued by the State Board of Health, "It is encouraging that most of the people of this county seem to appreciate this opportunity to protect themselves against typhoid and are availing themselves of the privilege. Only last Saturday in Henderson 150 were vaccinated. Doctor Absher the full-time county health officer believes that almost every person has accepted treatment where the campaign first started."

⁂

Saving Babies in Detroit.—The city of Detroit, Michigan, points with considerable pride to the following 1914 statistics:

Infant mortality rate for four congested districts January to July 1, 1914	201 per 1,000.
Infant mortality rate for same districts July 1, to December 31, 1914	92 per 1,000.

"Four Board of Health Nurses," explains the Bulletin of that Board, "entered these districts on July 1, and have since that time coöperated with mothers in promoting health and preventing sickness among infants."

⁂

Interstate Sanitary Districts.—The following important announcement is made in the Public Health Report for May 28, 1915:

"To facilitate the enforcement of the interstate quarantine laws and regulations the Secretary of the Treasury has divided the continental United States into districts to be known as interstate sanitary districts. The districts are as follows:

"*District of the North Atlantic.*"—That portion of the United States lying east of a line beginning at the junction of the seventy-fourth degree of longitude and the Canada line and extending southward to the forty-second degree of latitude and running west to the seventy-fifth degree of longitude, along which it extends south to the Atlantic Ocean.

"*District of the Middle Atlantic.*—That portion of the United States lying west of the seventy-fifth degree of longitude and bounded on the north and west by a line beginning at the junction of the forty-second degree of latitude and the seventy-fifth degree of longitude and extending west to the seventy-eighth degree of longitude, thence south to the fortieth degree of latitude, thence to the eightieth degree of longitude, and thence south to the Atlantic Ocean.

"*District of the South Atlantic.*—That portion of the United States between the eightieth and eighty-fifth degrees of longitude and south o the thirty-fifth degree of latitude.

"*District of the Gulf.*—That portion of the United States lying between the eighty-fifth degree and ninety-eighth degree of longitude and south of the thirty-fifth degree of latitude.

"*District of the Ohio.*—That portion of the United States lying between the eightieth and ninetieth degrees of longitude and the thirty-fifth and fortieth degrees of latitude.

"*District of the Great Lakes.*—That portion of the United States lying north of a line beginning at the junction of the seventy-fourth degree of longitude and the Canada line, and extending south to the forty-second degree of latitude, west to the seventy-eighth degree of longitude, south to the fortieth degree of latitude, west to the ninetieth degree of longitude, north to the forty-sixth degree of latitude, west to the ninety-third degree of longitude, and north to the Canada line.

"*District of the Missouri.*—That portion of the United States lying between the ninetieth and ninety-eighth degrees of longitude and the thirty-fifth and forty-third degrees of latitude.

"*District of the Upper Missouri.*—That portion of the United States lying west of the sanitary district of the Great Lakes and north of a line beginning at the junction of the ninetieth degree of longitude and the forty-third degree of latitude, extending west to the eastern border of Wyoming, north to the southern boundary of the state of Montana, west to its western boundry, which it follows to the Canada line.

"*District of the Rocky Mountains.*—The states of Wyoming, Utah, and Colorado, and

that portion of the states of Nebraska and Kansas lying west of the ninety-eighth degree of longitude.

"*District of the Rio Grande.*—The states of Arizona and New Mexico, and those portions of the states of Ok'ahoma and Texas lying west of the ninety-eighth degree of longitude.

"*The District of the Pacific.*—The states of California and Nevada.

"*District of the North Pacific.*—The states of Washington, Oregon and Idaho."

After-Effects of Typhoid.—The following statistics given in a press article issued by the North Carolina Board of Health should be an added incentive toward the prevention of preventable typhoid.

"A study of 1,574 cases of typhoid fever shows that 146 died while under treatment, which is not quite one out of every ten. Of the 1,428 who recovered from the immediate effects of the disease, the death-rate for the first three years was nearly twice the normal death-rate of a similar group of persons who had not had typhoid.

"As the cause of death among the patients who died following recovery from typhoid, tuberculosis heads the list with a rate of 39 per cent., with diseases of the heart following with a rate of 14.8 per cent. In other words, the chances for having tuberculosis are increased about three times in those who have recovered from typhoid, while the chances for heart disease are about doubled. In the United States each year, 8,000 deaths occur among persons who have recovered from an attack of typhoid fever but who, as a result of impaired vitality from the disease, succumb during the first or second year after recovery."

Health Inspectors and Patrolmen vs. Recreation.—An article in *The American City* for June makes some pertinent suggestions in regard to the coöperation of health inspectors and patrolmen in the adequate supervision of public parks and playgrounds and all other places where the children and youth of the crowded city congregate for recreational purposes. The prohibition of the liberty of the streets to children suffering from contagious diseases, the preservation of order and tidiness and the closing of certain streets in crowded quarters to accommodate playing children is advocated. Whether the ideas are all practical or attainable or not, the central idea of coöperation certainly merits serious consideration.

School Health Clubs.—The work of school health clubs in Johnston County, N. C., is causing comment in the state according to an article in the May *Health Bulletin*. In this county forty-five clubs with about twenty-five members to each club have been organized.

The health officer of Johnston County, speaking of the progress of the work and especially of the work of club officers, said:

"They at once began to change the appearance of the school buildings and grounds, and they spread this enthusiasm over the community until the community began to take on a new idea, and began to put things in good order. The result is that the schools are 100 per cent. better than last year and the homes are improved almost equally as well. Pumps have taken the place of the open bucket wells at the schools and individual drinking cups are used. The privies have been made sanitary and no trash is seen on the floor at any time. Meetings are held every two weeks and large crowds gather to hear the pupils discuss subjects pertaining to their physical welfare.

"One of the most beneficial features of the work is the service of the club officers as 'sanitary scouts.' As such they report to the health officer any condition they find not conducive to health. He prepares his 'scouts' for good service by instructing them in matters of health and sanitation and how to meet those conditions to which the duties of their offices are likely to lead them. He sees that the clubs have health literature to read and use, and gives personal attention to the club's monthly reports."

Closed Laboratories!—The following which appears on postal cards sent over the state of Minnesota is self-explanatory. The necessity of such action is greatly to be deplored.

ATTENTION, HEALTH OFFICERS AND PHYSICIANS.

"The Diagnostic Laboratory of the State Board at Minneapolis will be closed May 15 and no work along the following lines will be done until August 1, when funds become available.

"Work discontinued May 15 to August 1, 1915:

(1) Examination of nose and throat cultures for diphtheria bacilli;

(2) Virulence tests of cultures from diphtheria convalescents and well diphtheria "carriers";

(3) Widal tests of blood specimens for diagnosis of typhoid fever;

(4) Examination of excreta for typhoid bacilli in cases of suspected dangerous typhoid "carriers";

(5) Examination of specimens of sputum for tubercle bacilli;

(6) Animal inoculation tests of pus, etc., from suspected cases of non-pulmonary tuberculosis.

"The State Board of Health is compelled to close the laboratories, since the Legislature refused to grant funds needed to carry the work to August 1.

"Typhoid vaccine will be issued, free of charge, to physicians, upon request.

"Reports of cases of notifiable diseases and correspondence relating to investigation and control of preventable diseases will be attended to promptly."

*

A Kitchen Experiment.—The following from the weekly bulletin of New York City for May 29, 1915, tells of a unique and interesting experiment:

"For the past three months a public kitchen has been conducted by the Committee on Public Kitchens at 458 West 27th street for the sale of hot cooked food to be taken home for family use. Although operated under the Department of Social Welfare of the A. I. C. P., the kitchen is a business enterprise with a social purpose. Its aim is to sell at cost, good hot food for consumption in homes where it is impracticable to prepare meals, and to inculcate wholesome food habits. Those responsible for the management have tried to make a model kitchen. How well they have succeeded is indicated by the fact that inspectors of the Health Department's Division of Food Inspection have given a perfect score on the sanitation of the kitchen. Moreover, all the employees have been examined for evidence of typhoid infection by Widal tests and bacteriological examination of stools and urine, happily with negative result. These examinations are in line with suggestion recently made in these columns for the detection of typhoid carriers and comply also with the Sanitary Code relating to the handling of food by healthy individuals.

"The Department welcomes this enterprise as promising valuable support to its work in educating the public in matters of food and nutrition, and trusts that it will meet with the success that it so well merits."

*

Qualifications for Health Officers in New York State.—Under the provision of a regulation adopted by the New York Public Health Council, health officers appointed after November 1, 1916, will be required to have special qualifications for their work in addition to being physicians—

The qualifications adopted are as follows:

Resolved, That local health officers appointed after November 1, 1916, shall have the following qualifications:

I. They shall be graduates of medicine of not less than three years' standing;

II. They shall when appointed be not less than twenty-four nor more than sixty-five years of age;

III. They shall have complied with one of the following requirements:

(a) They shall have taken a correspondence course in public health of one year with at least one week of practical demonstrations in laboratory and field work, both correspondence course and demonstrations to be approved by the Public Health Council, with examinations and a certificate;

or (b) They shall have taken a course in public health of at least six weeks including practical laboratory and field work with lectures and reading at an educational institution, such course to be approved by the Public Health Council, with examinations and a certificate;

or (c) They shall have submitted evidence satisfactory to the Public Health Council of special training or practical experience in public health work, with examination if required by the Council;

Provided, however, that under special conditions specified in writing by the local board of health or other appointing power or by the health officer, any of these qualifications may be waived by the Public Health Council.

*

New York State Milk.—In the "Public Health Hints" prepared each week by the New York State Department of Health, the citizens of that state have recently been reminded that "the Section of the State Sanitary Code governing the quality of milk and cream sold throughout the state went into force Nov. 16, 1914. By this time its provisions should have been put in operation by the health officer of each city, town and village and everyone should be able to purchase properly *graded* and *labelled* milk and cream and to know just *what he is paying for*.

"The caps on bottles and the labels on cans of all milk or cream sold at retail must be marked—either: Certified, Grade A Raw, Grade A Pasteurized, Grade B Raw, Grade B Pasteurized, Grade C Raw or Grade C Pasteurized.

"Certified milk is the highest grade of raw milk. It is certified as of specially good quality by the county medical society and the herds which produce it must be tested once a year with tuberculin, and all cows which react, promptly excluded from the herd.

"Grade A Raw milk and cream must also come from dairies where tuberculous cows are detected and excluded by the use of the tuberculin test. It must have a low bacterial count and the farms producing it must make a 75 per cent. perfect score on the official score card of the State Department of Health.

"Grade A Pasteurized milk and cream comes from herds which are shown to be healthy, as disclosed by an annual physical examination by a veterinarian, but which need not be subjected to the more severe tuberculin test, and the farms need only score 68 per cent. on the Standard score card. It may contain more bacteria before pasteurization than Grade A Raw, but after pasteurization it can contain only half as many as are allowed in Grade A Raw. The process of pasteurization required by the Code destroys all disease bacteria and the State Department of Health strongly recommends the general use of milk which has been rendered safe by this process.

"Grade B Raw milk may contain the same number of bacteria and Grade B cream more than Grade A Pasteurized does before pasteurization, and the dairy score may be only 60 instead of 68 points.

"Grade B Pasteurized milk and cream comes from cows shown to be healthy, by an annual physical examination, and from dairies scoring 55 points on the score card. The bacterial limits are more lenient than for Grade A milk, but efficient pasteurization makes such milk entirely safe while its cost should be less than Grade A. It is the hope of the State Department of Health that this grade may soon make up a large proportion of the milk supply of the State.

"Grade C milk is only safeguarded by the provision that the dairies from which it comes shall score 40 on the standard score card and that it shall be delivered within 48 hours from the time of milking. This grade of milk and cream can not be recommended for drinking and should never be used without pasteurization or cooking, and should never be given to infants."

Public Health Notes.

The History of a Typhoid Carrier.—*The Journal of the American Medical Association*, June 19, 1915, contains an article on the above topic by Dr. W. A. Sawyer setting forth some interesting facts.

The author's summary follows:

"1. Although frequent examinations of the feces of the typhoid carrier H. O. gave negative results for four months after he had been treated with autogenous typhoid vaccine, he infected three persons when subsequently released from quarantine on parole. The total number of persons infected by this carrier is thirty, including five who died.

"2. In a further attempt to cure this carrier, the gallbladder and its duct were removed surgically, but the typhoid bacillus was found in the feces several times after the operation. Examination of the gallbladder showed that it was normal and that its contents were free from typhoid bacilli.

"3. After forty-one successive examinations of feces during a period of fourteen months, all with negative results, the typhoid bacillus was isolated from stomach contents containing bile.

"4. Certain typhoid carriers are unusually dangerous and must be controlled by quarantine or other adequate supervision."

Education, Sanitation and Crime.—The accompanying illustrations which recently appeared in the *Survey*, show the school-house, a tumbledown log structure, and the fine new brick and stone jail in a certain southern community. The pictures tell the quality as well as quantity of education. It is not at all surprising that a community, where education, where the children of the inhabitants are not held to be

deserving of better quarters than the "School-house" shown in the cut, should need a rather capacious jail for the confinement of the products which the educational system has turned out.

Can't you see a mental picture of the interior of this school-house? In the corner there is a bench on which is a bucket of water brought from a spring in the nearby pasture close to the manure pile, beside the bucket is a rusty tin drinking cup or dipper. A common towel hangs on a nail in the wall (probably over the water bucket) if, indeed, there is a towel. The new jail on the other hand is probably equipped with electric lights and modern plumbing.

*

Sterilization of Water by Chlorine.—The necessity for supplying troops with pure water has produced much discussion concerning methods of sterilizing water by means of chlorine. Capt. J. H. Nelson, I. N. S., describes a method for obtaining the chlorine from potassium chlorate by treating it with concentrated hydrochloric acid. The chemical reaction that follows is represented by the following equation: $4\ KClO_3 + 12\ HCl = 4\ KCl + 6\ H_2O + 9\ Cl + 3\ ClO_2$.

Besides the chlorine there is also liberated a large amount of chlorine peroxide which is a powerful oxidizing agent. It is probable that

some of this is acted upon by the hydrochloric acid with the liberation of chlorine. The apparatus for generating gas which the author describes weighs only twelve pounds and contains enough material to sterilize 9,600 gallons of water. Experiments have shown that the use of one part of chlorine for 500,000 parts of water allowing thirty minutes' contact gives excellent results. This source of chlorine has an advantage over the use of bleaching powder since the latter is unstable and difficult to obtain.—*British Medical Journal*, May 8, 1915.

⚜

San Francisco Session of the American Medical Association.—The reports of the proceedings of the Annual Session of the Association, held at San Francisco, which appeared in *The Journal of the American Medical Association* for July 3, are gratifying evidence of the work being done by the organization. The attendance was fully as large as the most optimistic expected. The number who registered from the Pacific Coast States proved the interest of the profession in that territory. The minutes of the House of Delegates show the efforts of the Association in advancing the usefulness of the profession in serving the public. The exhaustive consideration of the relations which physicians must meet in the sociologic conditions which prevail, especially in the development of workmen's compensation legislation, as they are presented in that portion of the report of the Judicial Council devoted to this subject, merits special study. The action of the House in directing that this subject be brought to the attention of the different branches of the organization shows the policy of the Association: that the medical profession shall seek to advance the betterment of conditions under which the people live and labor. This is but one evidence of the earnest thought which is being given to the problems which come before the House of Delegates. The number of important measures which were considered and wisely determined can be appreciated only by a careful reading of the records. The work of the Scientific Assembly—the sections—was good. The programs were excellent and most of the meetings were fairly well attended, and interest was manifested in the papers presented and discussed. The Scientific Exhibit, as always, commanded the interest of the Fellows; not only the excellence of the work displayed but its practical value to the profession and the clear demonstrations made by those who contributed were frequently commended. The Commercial Exhibit was most creditable and fully deserved the interest manifested by those who visited the booths of the exhibitors. The social events were well planned and carried out. Especially were the excursions enjoyed by those who were able to take advantage of them. The success of Commemoration Day has already been noted. The exposition did not detract from the interest in the work of the Association as might have been expected, but was always available whenever leisure time permitted the Fellows or their ladies to visit it. The members of the local profession exerted themselves with true California hospitality to provide for the comfort and pleasure of the visitors and are to be congratulated on their conduct of the convention. The San Francisco Session was a great success.

⚜

Suburban Infant Mortality.—No. 4 in the "Infant Mortality Series" of the federal "Children's Bureau," consisting in an excellent report on a study of infant mortality in Montclair, N. J., which place was chosen as a typical suburban community, has made its appearance.

The report, after a short introduction, recounts the general characteristics of Montclair with regard to location, history, population, wealth, industries, liquor licenses, hospitals and social agencies. The analysis then summarizes and correlates the effects of such factors as, environment—neighborhood incidence and housing, nativity, nationality and color of the mother, age at death and direct cause of death, sex, illegitimacy, attendant at birth, economic status of family, occupation and literacy of mothers, and feeding. The year for which the study was made was 1912 and the beneficient effects of certain remedial efforts is strongly emphasized. An infant mortality rate of 130.4 was recorded for 1912 in Ward 4 while that of the entire town was 84.6. Ward 4 is the most congested district of the city and the home of the greater part of the colored and foreign population, the latter being predominatingly Italian. In two years the rate of this ward was reduced to a point well below the average of the entire place. This gratifying decrease "should probably be ascribed largely to the development of the baby clinic, with the 'follow-up' visits of the nurse to the mothers in their homes

and to the careful supervision by the board of health of the housing and sanitation of this section."

The report is well worth careful inspection, partly because it corroborates modern ideas with regard to causes and effects of high infant mortality rates, but chiefly because of the encouragement and indisputable evidence it affords to public health unbelievers.

Humanized Milk in Infant Feeding.—The *British Medical Journal*, May 22, publishes an article by J. Epstein showing that humanized milk or cow's milk with a percentage composition of human milk, is a good food for healthy infants deprived of breast feeding. An examination shows that the upper fifteen ounces of a quart bottle of milk which has been standing for six hours at a temperature of 40 to 50 degrees F. has the following percentage composition: protein, 3.40; sugar, 4.50; fat, 8.90; salts, 0.70; water, 83.40. By diluting with an equal volume of water and adding sugar contents to the desired degree a substance very similar to human milk may be be obtained. This composition is as follows: Protein, 1.70; sugar, 7.00; fat, 4.00; salts, .037 or .035; water and .8695.

School Hygiene and School Architecture.—Dr. J. B. Todd, in the *New York Medical Journal*, June 19, sets forth the advantages of the one-story cottage multiple unit school buildings. He considers the present type of school building unsanitary because of the common corridors and toilet rooms in which all pupils mingle. In addition to this there are increased fire dangers and difficulties of ventilation. The saving in building spaces is slight and more than offset by the disadvantages of the present style of architecture for school buildings.

The plan of one-room cottage schools which originated with Dr. R. W. Corwin of Pueblo, Col., has now been adopted by many cities. This plan eliminates all unnecessary "contacts," fire risks, building costs, and ventilating problems. The large ground necessary is a distinct asset. The plan is elastic, inexpensive and facilitates school administration.

Precautions to Printers.—The following list of precautions under the above title appeared in the New York City Bulletin for May 22.

"Hoods must be placed over linotype metal pots, and have pipes connecting.

"Remember, pig-lead used in linotyping is softer than lead of type. Handle it as little as possible. Drop pig-lead carefully into melting pot. Splashings of molten lead dry later and become lead dust.

"Do not shake crucible in order to blend molten lead better. It will blend itself.

"Plungers on linotype machines should never be cleaned in the work room. Clean them in boxes in the open air. Avoid inhaling the dust.

"Graphite used for lubricating is not poisonous but all dust is irritating to the lungs.

"Avoid lead dust, as much as possible, when trimming and mitreing, or when sawing.

"Remove lead dust from type cases in the open air, or by means of a vacuum cleaner.

"Never put type into the mouth, or moisten fingers to get better hold of type.

"Benzine and lye are skin irritants. Use them with care.

"Insist upon having good ventilation in the office or factory, and insist that floors shou'd not be swept during working hours.

"Suggest to your employer that walls and ceilings of work room, if not of smooth, washable surface, should be lime-washed once a year; that close-fitting floors which can be cleaned by moist methods are desirable; and that type-cases should fit closely on the floor, or have legs high enough to brush under.

"Eat a good breakfast before beginning work. Food in the stomach, especially milk, helps to prevent lead-poisoning.

"Do not eat food, or use tobacco, while at work, unless your hands are first carefully washed, because of the danger of getting lead into the mouth. Do not use a 'common' drinking cup; such a cup may be employed by a tuberculous or otherwise infected person. Wash hands thoroughly with warm water and soap. Have your own towel and soap. Rinse the mouth and clean the finger nails before eating.

"Don't spit on the floor. Use cuspidors and see that they are cleaned daily.

"Eat your lunch outside the work room.

"Do not wear working clothes too long without change.

"Hang street clothes where they will not be exposed to the dust of the work room.

'Gas and electric lights should be shaded, to prevent a glare. The eyes should be examined

from time to time by a competent physician. Avoid ruining your sight by giving early attention to eye-strain. Headaches, blurred vision, red and inflamed eyes, dancing spots before eyes, twitching of the eyelids, are some of the first signs of eye-strain.

"Insufficient light may impair the general health.

"Bathe frequently, and brush the teeth each night.

"Avoid alcohol. It increases the danger of lead poisoning.

"Have a good bowel movement each day.

"Exercise in the fresh air as much as possible.

"Be examined by a doctor occasionally to protect yourself against the effects of your trade."

Issued by Division of Industrial Hygiene.
Department of Health,
City of New York.

Sanitation in Vacation Haunts.—Because thousands of people are choosing the place for their summer vacation by no other criteria than theoretical comfort and beauty of surroundings, it is well to bring to general notice the address on "Rural Sanitation, Its Interest and Value to Residents of Cities," read by Hyde R. Fussell, Sanitarian of the West Disinfecting Company, at the Safety and Sanitation Exposition in New York City.

The summer visitor to the country should assure himself that attractions such as a good room in a pleasantly situated house do not lead him to overlook insanitary conditions dangerous to his health. "We usually seek an hotel or boarding house," says Mr. Fussell, "that is good or fairly good, and we are satisfied to rough it in many respects for the time being. In fact the period of the year that should have been one of rest for us, a vacation, often ends in sickness, grief and a funeral, and this all through negligence regarding the care with which the locality of our summer vacation was selected.

"Undoubtedly, you make careful inquiries as to the beds and cleanliness of the place generally, and are particularly interested as to the table. In rare instances, you may inquire into the water conditions. You are usually informed that they have good drinking water and that the well is protected by a bed of sand or earth, and consequently, nothing can get into it. Frequently, the outhouses are located above the water source and possibly as near as one hundred feet. We all know that sand and soil do not prevent specific disease germs from entering water as after a time, the sand or soil becomes loaded with known disease-bearing bacteria which will get into the drinking water as there is no way for the soil or sand to cleanse itself or get rid of disease-bearing organisms.

"To visit an insanitary toilet, whether it be day or night, and all outside toilets are insanitary, is a duty always neglected, consequently, people subjected to this outside inconvenience practically put off nature's call. Then intestinal absorption takes place and our enemy, auto-intoxication, is with us. This is one of the poignant reasons why rural residents, in spite of their oxygen ad lib. are not as healthy as their city brethren who obey nature's call when made, simply because they have inside conveniences.

"Modern invention has given us inside sanitary closets which are absolutely safe in every way and installed without any difficulty in any country home no matter how humble."

Mr. Fussell also emphasizes the dangers from raw vegetables which have been fertilized with the contents of privies and cess-pools.

"Suppose, in your auto, you leave your home and its modern protection and journey with your friends to some noted roadside resort famous for it dinners. You get your dinner. It is a good one and you enjoy it. Yet it occurs to me that this enjoyment would be somewhat curtailed if you were familiar with the sanitary surroundings of that hotel, for in many instances the water you drink or even wash your hands with, is drawn from a well located a few feet from an outhouse, and from this outhouse to the kitchen where your food is prepared flies constantly perambulate.

"Traveling by boat, we are far from safe. The water with which we perform our ablutions and wash our teeth, is usually drawn from the river, and into this river the waste material of thousands of human beings, with its manifold disease-bearing propensities, is constantly emptied."

Industrial Hygiene and Sanitation.

Mine Safety Meeting.—The Third Annual Joint Field Meet of the United States Bureau of Mines, the American Mine Safety Association and the California Metal Producers Association will be held at the Panama-Pacific Exposition September 23 and 24. The meeting will be held near the time of certain other important gatherings of mining men which are scheduled to take place in San Francisco in September and a large attendance is expected at the following features of this notable exhibition:

On September 23, on the athletic field of the Panama-Pacific International Exposition, there will be a mine-rescue demonstration at 10 o'clock; at 2 o'clock in the afternoon there will be a first-aid demonstration; and at 4 o'clock a demonstration of the explosibility of coal dust.

On September 24, at 10 o'clock, will be held a first-aid contest for inter-state supremacy; at 2 in the afternoon a rescue contest for inter-state supremacy; at 4 in the afternoon a rock drilling contest; and at 8 o'clock in the evening, there will be an award of prizes and souvenirs at the Convention Hall.

A number of well-known mining men and others have been assigned to the various committees to have charge of the joint field meet:

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For Rural Sanitation.—Public Health Bulletin No. 68, by Lumsden, Stiles and Freeman, entitled "Safe Disposal of Human Excreta at Unsewered Homes," is a most excellent pamphlet to place in the hands of farmers and the inhabitants of unsewered villages. It is well illustrated, practical and of a style that will appeal to the most elementary sanitary instinct.

⚜

A New Bulletin.—The *Health Bulletin* of Harrisburg, Pa., made its initial bow to public health circles in April. Four of the eight pages are devoted to milk and cream analyses. The remarks and suggestions are pertinent and the request for an exchange of bulletins should meet with a hearty response.

A Good Type of Safety Sign.—

NOTICE.

When you see a place or machine not properly guarded, notify the safety committee. They want to know about it.

"This is one of the many educational and warning signs conspicuously posted throughout the New Jersey Zinc Company's plant at Palmerton, Pa. The New Jersey Zinc Company is well known for the practical character of its safety organization and the enthusiasm of its safety committees.

"This Company has a permanent exhibit of its devices and methods for promoting safety and health at the Museum's headquarters. It has twice been awarded Grand Prize for the excellence of its accident prevention methods at the Expositions of Safety and Sanitation held annually in New York, under the Museum's auspices."—Supplement to *Safety*, April, 1915.

⚜

"Alcohol vs. Safety."—The effect of alcohol upon the industrial worker is better realized today than ever before. W. A. Rice in *Safety Engineering* for May effectively tells where the alcoholic stands with the business man and the insurance companies.

"The man who drinks, even moderately, is no longer wanted in any line of work. He is not a good risk for life insurance. He is not wanted in little or big business. The railroads and the factories will not employ the drinking man if they know him. The man found drinking is discharged promptly. For successful work, the best results can be wrought by men who are abstainers, with level heads and sound bodies. The total abstainer is the man preferred in all the walks of life.

"The remarkable growth in public sentiment in favor of total abstinence means the conservation of human life, a lengthening of the average longevity, and consequently a gradual reduction in the death-rate from alcoholism. The most eminent medical authorities condemn the use

of liquors in any quantity as injurious to human life.

"From a business standpoint the life insurance companies and the fraternals are vitally interested in the fight to overthrow King Alcohol; for alcoholism is directly and indirectly the cause of a very large percentage of death cases which drain the mortuary funds of vast sums annually."

✻

Anti-Typhoid Inoculation in the Industrial World.—Dr. L. S. Mackid relates the experience of the Canadian Pacific Railway Company with anti-typhoid inoculation. It has been the experience of the company that each typhoid patient loses about 120 days. In 1911 there were 320 cases of typhoid fever on the Alberta division, meaning a loss of time to the company of 38,400 days. Two years ago the company made arrangements to furnish free inoculation to every employee who desired it. As to the time lost as a result of vaccination, about 95 per cent. of the men kept right on with their work. The other 5 per cent. were laid off for not longer than forty-eight hours. It required much persuasion to induce many of the employees to submit to inoculation. The author believes that the term inoculation should always be used instead of vaccination as laborers are likely to expect results similar to those produced by smallpox vaccination.

The following table shows the results of vaccination during the last two years:

Total number of men employed on the division	24,000
Total number vaccinated: First year 5,500, second year 8,400	13,900
Non-vaccinated	10,100
Number of typhoid cases among non-vaccinated, First year 220, second year 70	290
Number of typhoid cases among vaccinated: First year, 2, second year 1	3

Medical Officer, June 12.

✻

Small Injuries and Big Results.—The following interesting note is from the "Man on the Job" section of *Safety Engineering* for June:

REPORT SLIGHT INJURIES AND AVOID BLOOD POISON.

One of the biggest problems of the employer is the prevention of blood poison from the neglect of small injuries. The workmen, generally, do not report slight injuries, and, as a result, in a great number of cases severe infection sets in. We have been very successful in combating this condition by impressing on each individual workman the rule, "If you are injured, no matter how little, tell your foreman about it right away and go to the doctor. A slight injury may cause blood poison." We found that even after this rule had been impressed upon the workmen, some failed to report slight injuries and blood poison resulted.

✻

Constipation.—The Ford Motor Company through its publication "For You," gives its employees the following excellent advice regarding the danger of constipation:

"One of the greatest causes of constipation is irregularity in the habit of going to the stool. On the other hand, many of these cases can be permanently cured by the practice of regularity in this matter. Attempt a movement of the bowels at a definite time each day.

"To use cathartics and pills as a regular habit, is useless as a cure, and will only make your condition worse. It is much better to correct constipation by the use of proper food than by medicine.

"Persons subject to constipation should eat plenty of green vegetables, graham bread and such other articles of food. They have a mild laxative action. Drink plenty of water, but *not when you are working in a very hot room.*

"Exercise of the abdominal muscles by contracting and relaxing the abdomen also helps in a mechanical way.

"Nearly all the serious diseases are due in some way to constipation. Appendicitis, liver trouble, stomach trouble and many others come from constipation."

"*Be regular in your habits and eat the right sort of food.*"

✻

Judicial Protection For the Safety of Workplaces.—A recent decision of the Appellate

Division of the New York Supreme Court will have considerable influence in shielding a certain class of municipal safety ordinances from attack by emp'oyers who are seeking to avoid the installation of proper safety devices. The point of this case, *People* v *Kaye*, 160 App. Div. 644, was as follows: The Labor Law of New York makes mandatory the installation of automatic sprinklers in factory buildings of a certain character. In New York City these installations are to be approved by the Fire Commissioner. A city ordinance, prior to the state statute, authorized the Fire Commissioner to require such installation generally as he might direct. A certain owner refused to comply with an order made by the Fire Commissioner under the ordinance mentioned. His defense was that the state law had repealed the more specific city ordinance, therefore, since his building did not come within the class to which the state law applied, he could not be compelled to make the installation. The Appellate Division refused to entertain this argument and sustained the conviction. While this case involves more directly the question of safety than of health, it is nevertheless a matter of some gratification to those interested in the reduction of industrial hazard and displays the willingness of the courts generally to sustain action by city legislative bodies, which is reasonable and not clearly beyond the scope of their authority, adapted to the protection of the worker.

✻

Care of Excreta at Labor Camps.—The following provision, found in the chapter of the New York State Sanitary Code dealing with Labor Camps, should, if adequately enforced, go a great way in reducing the amount of stream polution in the neighborhood of the many camps which are constructed and used during the summer season:

1. The nearest part of a tent, building or car used for a labor camp must be not less than 50 feet from the water's edge of any lake or stream used for public water supply.

2. Every camp must have suitable privies.

3. If a camp privy is more than 200 feet from the water's edge it may consist of a pit not less than 2 feet deep. This pit, however, must never be filled within more than one foot of the top and the excreta must always be covered with dirt. Such a pit and shelter over it must be covered with fly netting, where it is to be used for more than 6 days in the period between May 1 and November 1.

4. Privies may not be located nearer to a source of water supply than 50 feet in any case and when they are located nearer than 200 feet they must fill the following requirements: There shall be no pit but the excreta shall be received in a water-tight tub or bucket which shall be periodically removed and emptied. Such privy must be screened and kept clean. The buckets must not be allowed to get so full that they will spill in removing. The contents of buckets used in this type of privy must be carried at least 200 feet from the water's edge and there either burned, or buried in a trench at least 2 feet deep and covered with a foot of earth. The buckets are to be rinsed with a disinfectant which shall also be poured into the trench.

✻

Eye-Shades.—Vol. I. No. 11. of "For You," the health and safety bulletin which the Ford Motor Company publishes for distribution to its employees, contains the following interesting note in regard to eye-shades:

Use Care About Eye-Shades.

It is dangerous to wear eye-shades made of celluloid when you are working near fires, furnaces, or any place where there is a flame. They may catch fire, and do serious injury to your eyes.

Men who were wearing celluloid collars have been badly burned because the collar caught fire and could not be torn off before the damage was done.

Celluloid is a material which burns very rapidly. If you had such an eye-shade and it caught fire, you might lose the sight of both eyes. It doesn't pay to take a chance.

Some goggles also have parts made of celluloid. These are almost as dangerous as the eye-shades, when working near a flame. Be careful to see that your goggles are protected by metal or by wire screen.

Be careful. You will be almost sure to have your eyes burned if you wear such shades near a furnace.

Unemployment in Massachusetts.—The question of unemployment always affects the matter of public health more or less directly since its result is to deprive the workers and their families of some of the nourishment or other means essential to the maintenance of the best health standards. The report of the Bureau of Statistics of Massachusetts for the quarter ending March 31, 1915 shows 16.6 per cent. of the members of the local labor unions of the state as unemployed. This is almost 2 per cent. less than for December 31, but is the highest for this quarter since 1908. For boot and shoe workers, representing probably the largest class, the percentage was 22.4.

A Bibliography of Labor Reports.—The Industrial Commission of the New York State Department of Labor has recently issued a bulletin, whole No. 71, comprising an annotated list of all the government labor reports received by that department from October, 1913 to May, 1915 together with a list of the government labor periodicals received by the New York State Department.

The introductory note calls attention to the fact that while this list is not exhaustive it is fairly comprehensive inasmuch as the department receives the publications of nearly all the similar departments in the world.

The list classifies the publication under the following divisions: (1) United States (Federal) reports, (2) State reports, (3) Foreign reports, (4) Periodicals.

There is a short note describing the field covered by each report.

This bulletin will be of immense value for reference purposes to those interested in labor statistics and labor legislation whether from the standpoint of the hygienist or sanitarian or otherwise.

First Aid Kits.—The New York Industrial Code, promulgated by the Industrial Board of the State Department of Labor, requires that a first aid kit shall be on hand at all times for the use of employees without expense to them in every factory employing more than ten persons in which power-driven machinery is used for manufacturing. The same rule requires that there shall be a suitable place for administering this first aid, and the other necessary facilities such as soap and water must be at hand.

A subsequent rule prescribes the contents of such kits as follows:

Instruments.

1 pair scissors. Tourniquet.
Thumb forceps. Graduated medicine glass.

Drugs.

2 oz. aromatic spirits of ammonia.
2 oz. 4% boric acid.
2 oz. alcoholic iodine solution, half strength (for external use).
2 3 oz. collapsible tubes of bicarbonate of soda mixed with vaseline [5%] (for burns).
2 oz. castor oil (for eye injuries).

Dressing.

1 doz. assorted sizes sterile gauze bandages.
1 spool Z. O. adhesive plaster, 1 inch by 5 yards.
3½ oz. packages of absorbent cotton.
3 1-yard packages of sterile gauze.
Splints of assorted sizes for fractures.
Wooden applicators wound with cotton.
Wooden tongue depressors.

This rule is all very well as far as it goes, but it is worth while noting that an occasional accident may happen in the small shop where less than ten men are employed. In such a case it is quite as important a thing to the man who happens to be injured to have the benefit of a first aid kit as it is to the man in the larger shop. The small shop is also more likely to be some distance from the nearest surgeon or physician than the large factory where many men are employed. The cost of the kit is so little that it could hardly be a burden to employers of only a few hands. The question of "where to draw the line" is indeed a perplexing one.

Industrial Accidents in Ohio.—That more care must be taken to prevent infection of wounds is strikingly demonstrated by a recent report issued by the Industrial Commission on accidents in Ohio. Of 25,731 industrial accidents causing loss of time but no permanent injury, one out of every 14 was infected in greater or less degree. Of 601 accidents which resulted in permanent partial disability, one out of every 29 was complicated by infection.

According to this report, the danger of infection is much greater in cases of lacerations, punctures, abrasions, bruises, etc., than in cases of burns and scalds. Of 15,389 cases of laceration, etc., one case in 10 became infected. One out of every 20 of the 2,208 burns, scalds, etc., covered by the report was rendered more serious by infection. Although getting a foreign body in the eye is not popularly regarded as dangerous, in one out of every 24 such cases, infection followed.

The 128 fatal accidents analyzed in the report were ascribed to a variety of causes. Thus 15 men were killed in coal mines, by falls of stone, slate, or coal. Another 15 were killed by falls from considerable heights. Nine of these fell from scaffolds, staging, etc., three fell into elevator shafts, and three fell while cleaning windows. The deaths of 33 men were ascribed to causes connected with the operation of various kinds of machinery, while hot metals, dynamite and other materials handled, cost 17 lives.

Stamping, shearing and punching machines won an unenviable first place among the different types of machinery causing permanent partial disability. Out of a total of 601 such accidents, 94 were ascribed to the action of machines of this type.

A large part of the report is devoted to causes of accidents, but it also contains a great deal of information concerning awards, duration of disability, hour of accident, day of accident, nature of injury, etc.

Anyone may secure a copy by addressing the Industrial Commission, Columbus, Ohio. The report is designated as Report No. 4 of the Department of Investigation and Statistics, and six cents should be inclosed to cover postage.

Personal Notes.

The following were elected to membership in the American Public Health Association on July 15, 1915:

Charles G. Plummer, B. L., B. S., M. D, Salt Lake City, Utah.

Isaac W. Brewer, M. D., Geneva, New York.

Payn B. Parsons, Bacteriologist, New York City, N. Y.

John S. Hitchcock, Health Officer, Northampton, Mass.

Ernest H. Cox, M. D., Cleveland, Ohio.

Industrial Commission of Wisconsin, Madison, Wisconsin.

Edwin C. Shaw, Akron, Ohio.

Randle C. Rosenberger, M. D., Philadelphia, Pa.

Prof. Willis J. Bray, Kirksville, Mo.

John A. Warkins, M. D., Pittsburgh, Pa.

Merrill E. Champion, Health Officer, Wollaston, Mass.

Frederick W. Berger, Bacteriologist, Baltimore, Md.

Harry B. Siegmund, Baltimore, Md.

Charles H. Jones, M. D., Baltimore, Md.

Lester W. Feezer, Cambridge, Mass.

Nicholas C. Hamner, Chemist, Dallas, Texas.

Wm. M. Wallace, Chemist, Detroit, Mich.

Louis I. Harris, M. D., New York City, N. Y.

Fred Adams, M. D., Toronto, Ontario.

Willis J. Spaulding, Springfield, Ill.

Lewis Fish, M. D., Fitchburg, Mass.

Algernon S. Barnes, Jr., M. D., St. Louis, Mo

Miss Mary B. Dickinson, Framingham, Mass

Walter H. Brown, M. D., Cambridge, Mass

CORPORATE MEMBERS.

American Telephone and Telegraph Co., New York City, N. Y.

Crane Company, Chicago, Ill.

*

Surgeon-General Rupert Blue, of the United States Public Health Service, was elected president of the American Medical Association at the recent San Francisco meeting.

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Mr. John Hall, for two years health officer of Long Branch, N. J., has been appointed health officer of East Orange, N. J.

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Mr. Charles F. Horan has been appointed health officer of Watertown, Mass.

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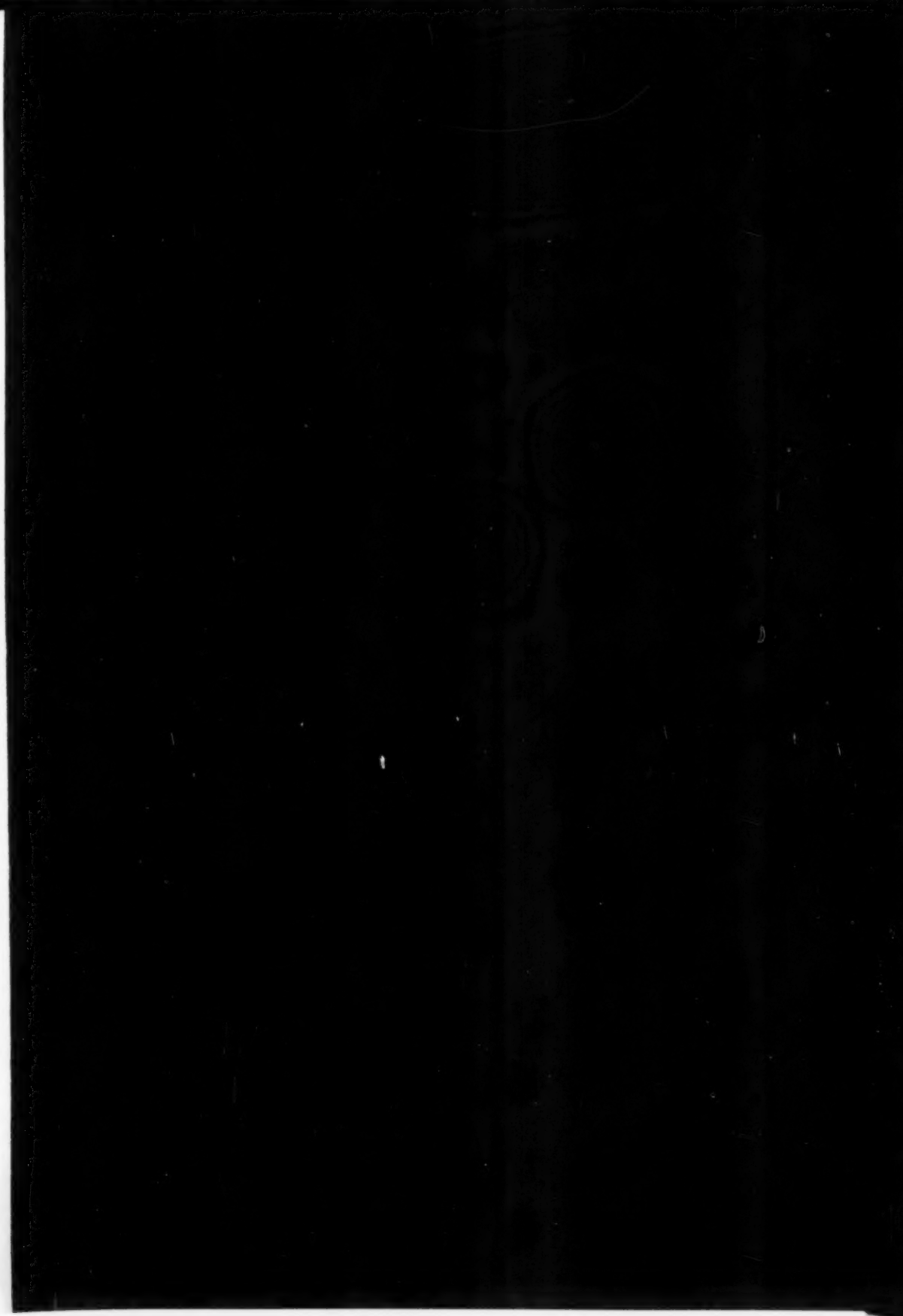
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